NEXT
GENERATION

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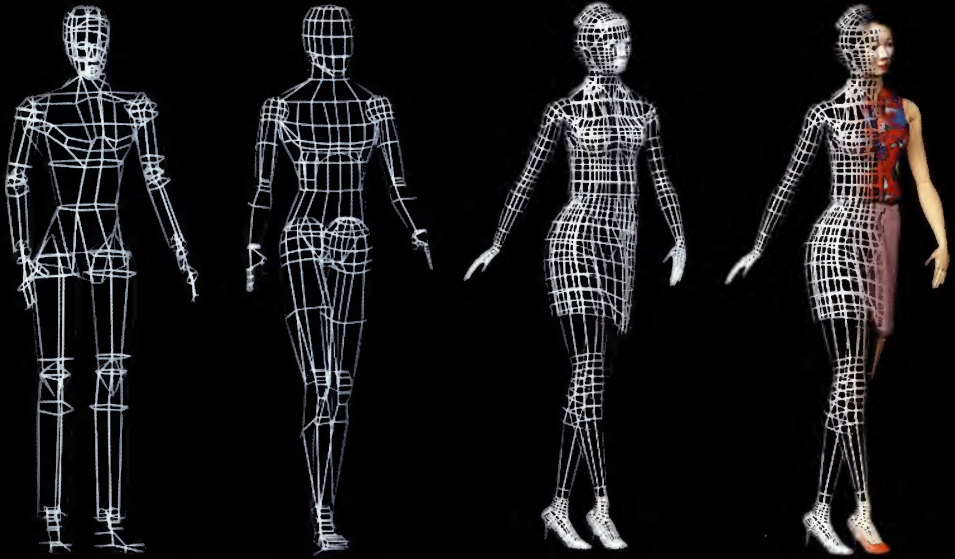
America's Elite

A landmark portrait of the most important people in the American game industry

volume **four**

37

Moving
towards
the future

At 120 frames per second, *Quake* ceases to be playable. Even if monitors could refresh at that rate (and none do), your eyes can't. So why did 3Dfx spend so much money developing a chipset with such capabilities? The answer is in our exclusive preview of 3Dfx's Voodoo^2 technology on page 88.

The games of tomorrow — *Quake 2* among them — will use that power to create more realistic characters and worlds. The facing page shows models rendered at 500 polygons, 2,500 polygons, and 12,000 polygons. In 1997, most game models were only as detailed as the one on the far left — with texture maps providing the additional features. In 1998, though, model quality will move up on the polygon scale. The result: characters that can move more realistically and games that are more immersive. For a look at how far 3D has come, see "Towards reality: the rise of 3D gaming" on page 78.

With all this power to make realistic characters, though, some developers are pushing the definition of reality to absurd heights. Lara Croft was only the first example of developers trying to create the "perfect" woman. Games are meant to be fantasy, but is the current trend of far-fetched female characters too much? Our investigation begins on page 98.

What do all these things have in common?
Each — the 3Dfx chipset, *Quake*, and Lara — came to preeminence in the U.S. because of America's gaming elite. This month we're pleased to present a landmark portrait of industry pioneers at the highest tier of the American game industry, starting on page 50.

Note: Subscribers will receive an issue with a special cover to commemorate our feature on America's elite, and a limited number of special issues will be available at select retail outlets as well. Regardless of which cover you have, however, the contents of the magazine are identical.
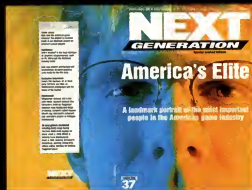
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NEXT GENERATION

January 1998

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Can Sony **stay on top?**

Sony's on top of the world right now, but can it avoid the same kind of fall that toppled Nintendo at the end of the 8-bit era and Sega at the end of 16-bit? Sony VP Phil Harrison is so confident that won't happen, he doesn't think it's worth discussing

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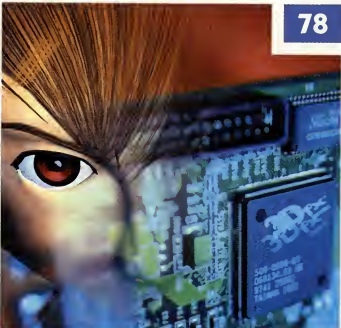
3D — past, present, **& future**

The history of 3D games, the exclusive report on Voodoo², and a report on Intel's AGP. Our 16-page section starts on page 78

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surfs off into the sunset, towards the single platform world of PSM. Good luck Doug. But who's this riding back towards our little Pueblo? Johnny Simpson-Bint? Well hitch up your horse and sit a spell. We'll try to keep things exciting around here.

Girls, girls, girls

Want to sell your game? Fill it with scantily clad women, says the conventional wisdom. But is the conventional wisdom right?

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America's **power players**

America is the most important game market in the world. In this special feature, we present the people who make the industry what it is — from the developers who make the games and the platforms they run on to those who get them on shelves. Here is our unique portrait of the people who sit atop the American game industry

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News
VM Labs reveals Project X — more powerful than Voodoo²? • Mac publishers try retail marketing — will it work? • Reviewed: *Phoenix, Second Edition* • Plus more news

Alphas: the hottest games previewed
The hottest games in the works, and the people and companies that make them. Want to know what the games of the future will be like? Find out here, every month

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Finals: 38 new games reviewed
If you read **Next Generation**'s reviews in November, you could have avoided *Fantastic Four*. What will we save you from this month? Turn to page 142 to find out

Next month ...
Next Generation's look at the hard-core gamer. Find out if you qualify. **NG 38** hits January 20

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ng **Disc** Contents

The latest games are mere mouse-clicks away on the **Next Generation Disc**

I n 1998 the **Next Generation Disc** will continue to provide the in-depth, exclusive industry coverage that its discerning readers have come to expect. Dozens of revealing and informative interviews, exclusive movies, and playable demos take full advantage of this CD-ROM's 635 Megabytes, providing unique insight into each title.

On The Disc this month: Intel's Jason Rubenstein discusses AGP's effect on the game industry, Infogrames' Olivier Masclef explains why he's an *Outcast*, and Activision's Andrew Goldman, Scott Krager, and Murali Tegulapalle visit **Next Generation** with three new games.

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special
Battlezone, Outcast, SiN, Interstate '76 Nitro Pack

previews
San Francisco Rush, Nuclear Strike, Shipwreckers, Extreme-G

talking
Intel's AGP in exclusive interviews, movies, and screenshots

finals
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pc
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CD See the **Next Generation Disc** when you read an article with this symbol on it

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Say hello to life in the fast lane. Sonic R for Sega Saturn is a full-on, pedal-to-the-metal 'hi-speed dash through five 3D courses, each rendered in full 360 degree panoramas. Choose from 5 different Sonic characters to race. Uncover hidden characters and secret shortcuts along the way. Whether you race tag team, relay or split-screen against your buddy is your call. You'll be flossing bug guts out of your teeth for weeks. Yum.
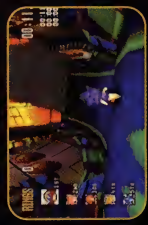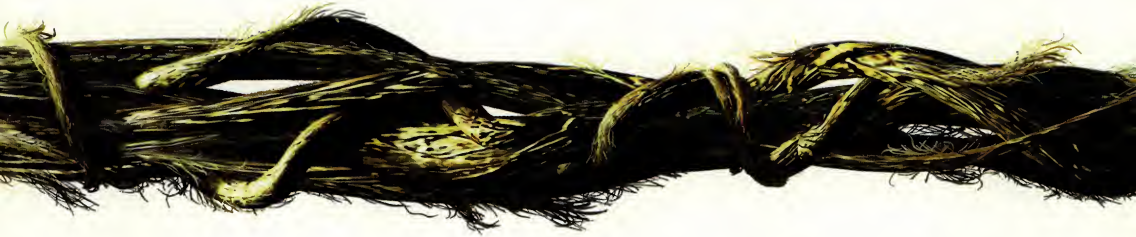
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HANG ON.

PlayStation is today's undisputed champion of the videogame world. But in all of videogame history, no company has ever managed to survive an upgrade of system with its market lead intact. So, as rumors of PlayStation 2 start to spread, **Next Generation** asks Phil Harrison, Sony's vice president of third-party relations and research and development, ...

Can
Sony stay
on top?

A perennial gripe from companies such as Sony, Nintendo, and Sega is that magazines such as **Next Generation** are never satisfied. No sooner does a new videogame console arrive and get itself established, and we're clamoring for the next big thing. They have a point, but heck — it's our jobs to keep an eye on the future. And as hard-core gamers, we're always the first to demand bigger, better, and more. So although Sony's PlayStation is still a great system and seems destined to thrive for years to come, we're still interested in the future. And that means talking about PlayStation 2 and asking the inevitable questions: Can Sony do what no other videogame company has ever been able to do? Can Sony repeat the success of PlayStation in the next generation? And, to put it in a nutshell, are Sony's days at the top of the videogame heap numbered?

Sewing the seeds ...

NG: Traditionally, no videogame company has been able to keep its lead from one generation of systems to the next. Atari lost out to Nintendo's 8-bit NES, Nintendo lost to Sega's 16-bit Genesis, and then Sega lost to Sony's 32-bit PlayStation and the Nintendo 64. It seems that juggling an established business with a successful introduction of a new system is a trick no one's ever managed to pull off.

So is Sony destined to fail when the 32-bit age comes to a close? Will another company be the videogame leader in a few years time?

Phil: Speculation about any future technology has to be tempered with the fact that we believe we're not even 25% done with the original PlayStation yet. Whatever method you use to calculate sales, we're doing great. We've just gotten to 20 million machines sold worldwide. We've gotten to a point where the hardware is at a low price and there is a very compelling catalog of software. Consumers are buying it in droves.

There is nothing to suggest, in any future, near- or medium-term, that PlayStation is going to run out of steam. So we're not even considering a next generation at this time.

NG: You're claiming that absolutely no one within Sony's R&D is working on PlayStation 2? That seems awfully irresponsible, given that your 32-bit technology will have to be replaced one day, and the original PlayStation took almost eight years to develop in full ...

Phil: Well ... [smiles]. It is true that Sony is a very R&D-led company. R&D has been the foundation of our company for more than 50 years. It is also true that the team that created PlayStation's technology is still on staff. [These people] weren't fired, moved off, or given a new career path.

They're working very hard on a variety of different PlayStation R&D projects, some of which are software-based, focused on delivering our developers better sets of libraries and development tools so they can make better games.

NG: So your R&D efforts are geared towards making better games on the existing PlayStation, as opposed to

talking

Phil: Right. And if you compare today's PlayStation games to the very first ones, you'll see a definite increase in quality. Some of this is because developers are comfortable with the environment and hardware, they're getting to understand it, and they're starting to make it sing. But another significant reason is that at Sony, we have continued to support our developers with new programming libraries. We've created new APIs, which are extremely powerful and allow developers to get even more power out of the machine. And this has really been the main focus of our R&D efforts over the last two or three years.

NG: Great. But getting back to the original point, is the R&D staff also working on PlayStation 2?

Phil: It is the job of an R&D company to keep abreast of all current trends and developments in the industry

established platform reaches maturity, like where PlayStation is now, it's time for the seeds of its successor to be sown. Isn't this a danger for Sony that someone else will inevitably try and steal the next market from under your noses?

Phil: Most hardware generations historically have been forced by a need to introduce, rather than merely wanting to introduce, a new technology. And right now there's no need for a new hardware generation.

NG: Are you talking about the needs of the gamers or the needs of the videogame companies?

Phil: In all senses of the industry. If you look at the 16-bit cartridge model as an example, it ran out of steam — technically, creatively, and commercially.

NG: Actually, Nintendo had one of its most profitable years with Super NES after the launch of PlayStation and Sega Saturn. The fact that a console is commercially successful wouldn't seem to guarantee its parent company's future.

Phil: You hit the nail on the head: Nintendo made a lot of profit, but the third-party industry was bleeding and coughing blood at the time. The odds were stacked against the industry because of the cartridge model. And the 16-bit crash, if you want to use that term, came about because of a lack of creative and technical innovation. The technology provided barriers beyond which developers could not move. You could not do anything else with a 16-bit cartridge-based system beyond the rudimentary, sideways-scrolling, eight-direction games. Therefore, what tended to happen in sequels or iterative versions of games was that the difference was indistinguishable. All the games started

I would contest vigorously the suggestion that all PlayStation games are the same. PlayStation games are constantly improving and will continue to do so

and to start predicting future trends, but at this point we have no plans to change our current technology.

NG: You don't want to talk about PlayStation 2 at all, right?

Phil: It would be premature to discuss it because, as I said, we're still just scratching the surface of PlayStation as it exists today.

Does history repeat itself?

NG: But videogame history has taught us that when an

to look the same. Consumers could not discern a compelling difference between the prequel and the sequel, therefore they voted with their feet and walked to those formats that did deliver creative innovation. And that format turned out to be PlayStation.

NG: There are increasingly more gamers who think that PlayStation games are starting to all look the same ...

Phil: No, I would contest vigorously the suggestion that all PlayStation games are the same. PlayStation games are constantly improving and will continue to do so. We just recently introduced the 2700-based development series, a new PlayStation development system. It's a program analyzer and development system all in one, which allows developers to really get a global view of what is going on inside the PlayStation hardware at any one time. And this allows them to tune up their software to get a level of technical performance that had previously not been seen.

We've also done some analysis of existing software titles in the marketplace and have realized that the best games launched to date don't even get to half of what the PlayStation technology is capable of. Now we've worked out how to harness this extra power. We've delivered this technology into the hands of the developers, and we will see more and more high-quality products pushing the technology even further throughout 1998 and into 1999.

NG: Let's approach this from a different angle. Looking back, did Sony succeed in the next generation marketplace, or did Nintendo and Sega fail?
Phil: It's a very good question. Certainly you can say that our success, by definition, meant the failure of our competitors.

NG: But would you agree that Sega and Nintendo stumbled over the changeover from 16-bit to the next generation, and that to some extent they left the door open for Sony to march in?
Phil: Um, I'll leave it to **Next Generation** to pass comment on our competitors.

NG: One last try. Were you impressed with Nintendo's handling of Nintendo 64, or did you expect more from the game industry's 900-pound gorilla?
Phil: If you ask me that question as a gamer rather than as an executive of Sony, then from my heart I can answer that I have always respected the products that Nintendo had brought into the market before. But I think that its hype and my personal expectations were in no way realized by its latest product offering [Nintendo 64].

But as somebody who works for Sony Computer Entertainment, I have to imagine that our rivals were forced to act because of the strength of PlayStation, and as a result, they maybe acted prematurely or with more haste than was appropriate, and they made mistakes. But this is not really for me to comment on.

NG: You said that Nintendo lost ground to Sony because third-party Super NES publishers were

investment in order to make money.

NG: But while Sony and the main third-party publishers concentrate on milking a mature PlayStation market, hard-core gamers will start looking for something new. Simultaneously, ambitious software developers will start looking to get an early foothold in whatever new market is emerging. Won't this give a new, higher-powered platform the opportunity of pulling the rug from beneath PlayStation's feet?
Phil: We do not see any competitive technology, be it hardware or software, that will act as a significant competition to the success of PlayStation worldwide. The amount of support that we have from the consumer, from the retailer, from the development community and publishing community is significant to the point of ubiquity.

We do not see any competitive technology, be it hardware or software, that will act as a significant competition to the success of PlayStation worldwide

"coughing blood." Can these third-party publishers, such as Acclaim or EA, force a change of format? Or is it up to the first-party manufacturers, such as Sony, Sega, and Nintendo, to force themselves to the fore?
Phil: It's a symbiotic relationship. Both have to be working in concert. The platform holder [Sony, Nintendo, etc.] has to be taking certain commercial risks that perhaps a third party is unable to do — to push the installed base forward. But you also have to ensure that the rest of the industry comes with you. And that is why we feel very confident with PlayStation — we have no less support than we had two or three years ago. In fact, our support grows in quality, sophistication, and investment every day. If publishers weren't making money out of the PlayStation format, they would not be able to invest in development for the future. And the fact that they continue to make games in greater and greater quality and sophistication is the biggest vote of confidence ...

The PlayStation format was designed on two solid premises: one, that it would be the creative choice of the development community, and equally important was that it would be the commercial choice of the managers and sales and marketing executives of the software publishers. You have to get the balance right between the two. You could deliver the development community the most incredible technology, but if there wasn't a compelling installed base or hope of an installed base, nobody would support it because the people who write the checks need a return on

Threat from the PC
NG: OK then, instead of competition from another console, let's consider competition from the PC. Given that game developers will always want to work with the most exciting, powerful hardware, how can you ensure that the third parties' best development teams don't switch to PC development? Isn't there a danger, as the PC goes from strength to strength, that in the eyes of developers, console development could become a backwater?
Phil: Most programmers, deep down, are artists. They

want to express themselves on the broadest possible canvas that has the broadest possible commercial application. The PlayStation is the only format around the world that allows the developer to reach an audience of tens of millions of consumers. There is no other platform that delivers that.

NG: You're not threatened by the PC game market at all?
Phil: The PC is a very polarized hard-core market — a very small number of people buy a lot of software. Yes, there is some very interesting innovation in the PC market with the 3D graphics cards, but these are saddled to a two, three, four-thousand-dollar box that is not a mass market proposition. This is not a competitive technology with PlayStation.

NG: Would you agree that PlayStation succeeded because it captured the hearts and minds of hard-core gamers?
Phil: Yeah, and we did that by having the best possible games at the best possible price. Consumers reacted positively to what we had to offer and have been

rewarded by an ever-increasing stream of games that shows no signs of slowing down.

NG: But now, by your admission, "a small number who buy a lot" — in other words, the real hard-core gamers — are playing on the PC. Isn't there a worry that where the hard-core gamers go first, the casual gamers follow?
Phil: I don't believe that to be the case. The PC market is a very insular market. It is not a growing market. It is a market that regenerates itself regularly by the same consumer upgrading, investing more money in the same box, or buying a new box because they need to get a Pentium II or 3Dfx or what have you. The PC does not pervade into the mass market the same way that a sub-$200 videogame system can.

NG: Hasn't the rise of the PC as a game machine surprised you at all?
Phil: We predicted that the PC's performance would

improve. The fundamental law that governs the performance of PC technology is a pretty straight, upward line. We knew that this would happen, and it's not something that necessarily threatens the PlayStation at all. PlayStation is a different market; it appeals to a different kind of consumer. And as we extend more and more into the mass market around the world, the difference between a PlayStation consumer and a die-hard PC consumer broadens every day.

NG: Another big attraction for gaming on the PC is the potential for online play. Is this a threat to the PlayStation with no modem?
Phil: No, because nobody is making any money out of the online business. Nobody makes any profit from selling online games. It has become more of a "feature" for PC games, a bullet point on the back of the box than any business model to add to the profit potential of any one title.

Games versus Hollywood
NG: So you're not frightened by any other videogame company.
Phil: PlayStation is so successful now because some very smart people in Japan made some very inspired choices about certain forms of technology in 1993, knowing that by the time we got to 1996/1997, the price and availability and supply of this technology would be broad enough and cheap enough to deliver a $150 box. As you know, we launched at $300 in the U.S. and at $400 in Japan. And even at these high prices to begin with, we were losing money on the hardware. But we knew, because of some very inspired decisions, that we would be chasing a curve down in price and that come 1997, we would be able to offer this technology at a very competitive price.

So now, any new company that enters into the business has to have a similarly broad view of what's going on in the chip technology market and the production technology market. It has to have skills which, frankly, only a very few people in the world have, and only very few companies in the world have. Building two million PlayStations is no mean feat, and it involves a whole department of people whose job it is to ensure that we have a supply of PlayStation components from more than one hundred different sources. To succeed doesn't just take a bag full of cash and some smart technology. Success requires a bunch of very sophisticated, interconnecting elements that all have to come together. While I'm sure there are other companies that have a piece of the pie that looks very attractive, I don't believe there is another company that could bring all pieces to the table at the same time in a cohesive manner to be successful.

NG: So what do you see as PlayStation's main competitor?
Phil: Our competitors in the big, big sense are other ways people spend their disposable time. There are only so many hours in the day that can be expended on entertainment — a certain number of hours will always have to be dedicated to sleeping, eating, working, or going to school. Only after these things can people watch television, watch a rented movie, listen to music, or enjoy some new form of entertainment. Sony's challenge is to present to the consumer a very compelling set of products that allow them to change and shift their patterns about how they consume media towards interactive entertainment.

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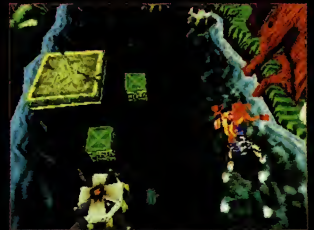
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CRASH 2
CORTEX STRIKES BACK

PlayStation

Project X confirmed for 1998: VM Labs announces its high-powered console • **Mac games aim for high visibility:** The Macintosh Entertainment Software Alliance (MESA) makes more room for Mac games • **Phoenix:** The comprehensive (if dry) history of videogames reaches its revised, second edition • **Plus:** All the regular columns

news

All the news that's going to be news

Project X
confirmed **for 1998**

VM Labs reveals exclusively to Next Generation its plans for world domination

After months of rumors and speculation, VM Labs has officially confirmed to **Next Generation** that Project X, a major new gaming platform, exists and is on schedule for release in late 1998. According to CEO Richard Miller, the company has forged partnerships with "several of the top half dozen or so consumer electronics companies in the world." Additionally, the hardware specs are complete, "prominent" third-party publishers are in possession of development kits, and, as **Next Generation** goes to press, the second iteration of the chipset has been delivered to VM Labs' California headquarters. "The chip is very real and working fine," smiles Miller.

The California-based company isn't willing to show all of its hand just yet, however. "We're simply confirming that we exist," explains Miller. "It's too early for us to reveal to our competitors our entire strategy." Nicholas Lefevre, VM Labs' VP of business affairs and general counsel, offers, "Our real coming out party will be sometime early next year." But although Project X's core specifications and the identity of VM Labs' key partners remain secret, **Next Generation** has learned enough to consider Project X a viable contender.

At the core of VM Labs is a team of 27 experienced engineers, led by Miller, and many of whom

Is it too late and/or impossible for a fourth competitor to force its way into the console wars? VM Labs doesn't think so

served considerable time at Atari. Miller himself was VP of technology at Atari from 1989 to 1994, while John Mathieson, VM Labs' VP of technology, is credited as "the father of Jaguar." As well as Atari alumni, the VM Labs team boasts experience working on 3DO's original Opera chipset, M2 I/O hardware and peripherals, Sinclair's Spectrum and QL projects, and at Apple. Game designer Jeff Minter, creator of *Tempest 2000* and notorious industry veteran, is also on board. Greg LaBrec, previously at Sony, was sufficiently impressed by Project X to sign up in November, and further credibility was given to the project when Bill Rehbock (another Atari alumni) also jumped ship from Sony to become VM Labs' VP of third-

party development around the same time. Why leave Sony at the height of PlayStation's success? "They knocked my socks off," Rehbock says. "I wouldn't have left [Sony] unless this was a sure thing."

In response to speculation that Project X is a 64-bit system, Miller reveals that, "No it isn't." He goes on to comment: "The argument that more bits are better doesn't hold water. This doesn't mean that we're not more bits — we are. But it's a crazy game to get into. We got into this with the Jaguar and it was terrible." What he does offer is the claim that Project X is "substantially" more powerful than PlayStation or Nintendo 64.

"At the heart of Project X is

The VM Labs team includes former Atari and Sony employees
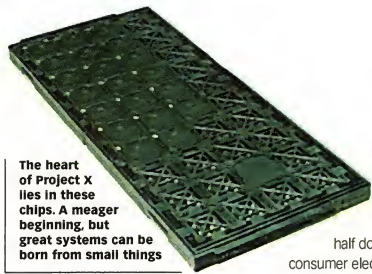
The heart of Project X lies in these chips. A meager beginning, but great systems can be born from small things

some graphics technology that is really quite different from anything you've talked about in **Next Generation** before," Miller says. But those looking for benchmark polygon-per-second counts will be disappointed. "We're not going to try and force games into any particular mode," explains Lefevre. "The graphics will be appropriate to the game, and not the other way around." Certainly, many experts in the computer graphics industry believe that the next generation of machines will not be polygon-based. But at this stage VM Labs will neither confirm nor deny it is taking this route.

What has been confirmed is that more than one company will be manufacturing Project X machines. In this respect, the project echoes 3DO's approach — but this is a comparison with which VM Labs is understandably uneasy. "We'd rather not see those three letters anywhere in the article," Lefevre laughs, while Miller is quick to point out: "After spending a few minutes showing what Project X can do, publishers don't seem to want to make the comparison with 3DO at all." But comparisons with business models are inevitable, and this manufacturing strategy will undoubtedly affect the street price of Project X. History has taught us that third-party manufacturers always demand a profit, yet successful videogame consoles have to be sold at or below cost. Miller seems unconcerned, however. "We want a high-volume consumer price point, certainly," he says, but also acknowledges that he has "learned the lessons of overpriced consoles and platforms."

So who are these hardware partners? What brand name will gamers see stamped on Project X's casing? "Our OEM partners, the people who will be building this

product, and there are several, are among the top half dozen or so consumer electronics companies in the world," says Miller, careful not to reveal too much. "At this time they are increasing their support and commitment to us. They are paring down any work they may have been doing in similar areas, and as they are seeing our technology mature, they are able to commit to it in an increasing degree."

Miller certainly isn't scared of taking on Sony, Nintendo, and Sega's next generation offerings. "It's no secret that Sony, Sega, and Nintendo will be coming out with next generation platforms," he concedes.

By launching in late 1998, the timing of Project X's debut will give it a two-year jump

"But our partners would not be signing up with us if they did not believe that we could beat them. A broad brush summary of our position is that we have the technology, we have the people, we have the partners, and we have the financial strength to make this happen."

In fact, it seems likely that by launching in late 1998, the timing of Project X's debut will give it a two-year jump on Sony and Nintendo's next machines. "That's a very smart speculation," Miller acknowledges. "I don't think anyone believes that Sony or Nintendo will come out with anything new before Christmas of 1999. They've got to milk their existing platforms for quite a bit longer yet." And as for competition from Sega, Miller doesn't feel threatened. "We all know what Sega's new platform is," he claims, "and it's hard to see how it can be competitive with what we are doing."

So what's the next hurdle for Project X? "VM Labs is three years old," says Miller, "and a good part of this time has gone into developing the core technology and this new graphics engine. But an even more substantial part of our effort has

been on building a platform and a development system. We're not just building a graphics engine that goes in the middle of some manufacturer's box." And this commitment to providing the whole package means it's time to start spreading the word to the game community and touting Project X to game developers.

A hand-picked selection of "prominent" game developers is already "very excited" about Project X, confirms Lefevre. Development kits are in the field and "key titles" are under way. "But we're not taking a Trip Hawkins approach," he cautions. "We're being very choosy with whom we're working with. We're paying a lot of attention and providing a lot of support and resources to these key developers. Early next year, when we have a kind of handover development system and more of a support organization internally, we will certainly be able to broaden it." But Miller says that for now, the company's approach is geared towards "quality not quantity."

Certainly, and perhaps after Atari's shabby handling of Jaguar, VM Labs is keen to stress that Project X will not fail due to a lack of planning or development support. "This attitude is demonstrated by Bill Rehbock and Greg LaBrec joining us," Lefevre explains. "Our bigger focus now is on properly supporting the interactive software community and helping them to get the most out of our platform." Rehbock backs up this claim, citing VM Labs' development support as one of the reasons he quit Sony to sign up. "I don't think the team at VM Labs has left a stone unturned with regard to development tools," he reckons. "Having worked at Sony, I'm used to good tools. But the guys at VM Labs hail from all facets of the gaming industry and have written tools from a game programmer's perspective. The teams we've put together at Sony, while they offered the best support around, simply weren't gamers."

It seems that the first shot of the next generation hardware wars has been fired. **ng**
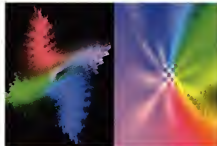
Screens from Jeff Minter's (predictably psychedelic) Project X graphics demos

breaking

Mac games aim for high visibility

MESA makes a grab for more shelf space

TEN upgrades its front end

The Total Entertainment Network has announced that it will be moving to a Java-based front end. Currently the company uses a proprietary, stand-alone front end that must be launched separately from a web browser. "By eliminating the stand-alone front end, we make playing on TEN one step easier," says Leslie Mansfield, TEN's spokesperson. "It is also far easier to add in support for new games." The Java-based applet will run in either Navigator or Internet Explorer and will feature the same functionality of the current stand-alone front end. To download the new applet, go to http://www.ten.net.

In a struggle to combat retail shelf space and visibility problems, Apple Computer and Mac game publishers are jointly taking on an aggressive marketing campaign this season. Members of the Macintosh Entertainment Software Alliance (MESA), a group of Macintosh game developers and publishers, together with Apple, purchased prime retail space and end-caps in stores including CompUSA, Computer City, Best Buy, and Micro Center. Such space comes at a high price — an end-cap in Computer City costs more than $100,000, says MESA President Peter Tamte — and normally would be out of reach for a single Mac publisher. Think of it as a kind of Macintosh games marketing collective.

Tamte, who is also executive director of GT Interactive associate MacSoft, which currently dominates Mac game publishing, says Apple contributed "a significant amount" towards the cost, but he declined to state an amount or percentage. The group hopes to make retailers say, "Wow! Mac games do sell!" Tamte explains, as well as to make consumers realize that many top-notch games are available for the Mac platform.

Together with input from retailers, the group chose to highlight predicted best-sellers. As a major publisher, MacSoft holds six of these "top ten" spots with *Duke Nukem 3D* and *Shadow Warrior* from 3D Realms, *Quake* from Id Software, *Civilization II* and *Master of Orion II* from MicroProse, and *Jack Nicklaus 4* from Accolade. The other games are Bungie's *Myth: The Fallen Lords*, Interplay's *Starfleet Academy*, CUC/Blizzard's *Diablo*, and Graphic Simulations' *F/A-18*

MESA focuses its efforts on making high-quality Mac games more visible and accessible

Hornet 3.0. Hybrids weren't included, so Red Orb's *Riven: The Sequel to Myst* won't be among the highlighted titles. (Besides, that company has already spent quite a chunk on retail space for that title.)

MESA has also begun a "Buy two, get a free Mac game by mail" promotion, supported by advertising, direct mail, and in-store merchandising. Those who purchase two games from the participating software companies receive a coupon, to be redeemed by mail, for a third free game to be chosen from a separate list of products. The promotion is expected to run through December 31.

MESA was formed last March as a nonprofit corporation for several reasons: to help developers and publishers of Macintosh entertainment software with marketing and business initiatives, to promote the Mac as a premier platform for games, and to enhance the business relationship between Apple and the entertainment software developers. Current members include Blizzard, Bungie, Changeling, Graphic Simulations, LucasArts, MacPlay, MacSoft, Parsoft, StarPlay, *MacAddict*, *MacHome Journal*, and Mac Publications. Membership is available to entertainment software developers and publishers for a nominal fee.
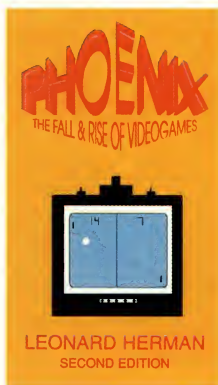
Phoenix:
The Fall and Rise of Videogames, Second Edition

Book review

Phoenix, originally reviewed in **NG 7**, is an encyclopedic reference guide for anyone interested in the history of home videogames. Unlike Steve Kent's forthcoming game history book, it makes little attempt to get into the minds behind the games. Rather, it's a chronological retelling of the history of home games — who showed what at which CES, who announced which games when, who sued whom, who bought whom, and so on.

Author Leonard Herman may not win any prizes for his prose — it's workmanlike, even wooden at times — but the amount of data he's collected means that *Phoenix* should be considered a must-read for anyone interested in videogames. If you didn't live it, you can read it in *Phoenix* and be just about as knowledgeable.

This update to the original (which was first published in late 1994) continues the history to the present day. Herman has also fixed some of the errors of the first edition (mostly spelling mistakes), retypeset the book in a more legible font, and addressed the most common complaint about the first edition by adding photos of the classic systems he covers. Unfortunately, the pictures won't be big or detailed enough for some readers, but it's definitely nice to see shots of old hardware like Broderbund's U-

The second edition of Herman's *Phoenix* is more must-have than the first

Force and screenshots from rare games like the infamous Atari 2600 cart, *Custer's Revenge*. One other change: Herman has dropped the word "home" from the title, which is reflected in the greater amount of arcade coverage included this time.

In short, if you're reading this magazine, you should own this book. It costs $21.45, postpaid, and can be ordered from the address below.

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In the
Studio

If they're making it, we're breaking it

When the mass of PlayStation programmers discovered how to make bumpy 3D landscapes, it was only a matter of months before "all-terrain"-style racing games flooded the market. Now the sequels are in production, as sources within Accolade confirmed *Test Drive: Off Road 2* will be ready later in 1998.

In the development-teams-leaving-companies-to-do-their-own-thing department, the *Pandemonium 2* team has split from Crystal Dynamics. The lead artist and lead programmer have remained with Crystal, but four or five members of the team have left to form Shaba, a nine-person development company that was still in start-up mode at the time of this writing.

One of the army of animators working on the fully rendered, feature-length *Final Fantasy* movie has leaked a few details about the film. The new movie will not feature any of the characters from past *Final Fantasy* games, but there will be similar themes and a heavy science-fiction influence. According to this animator, the lead character of the film will be a man named Grey, who is apparently reminiscent of Brad Pitt. Full production has not yet begun, but early renders and storyboards are said to be "intense." Talent recruited for the project includes former Disney animators, an art director from the movie *5th Element*, and the former Namco CG director whose credits include the opening cinematics for *Tekken 2* and *Soul Blade*.

ASC Games may have snatched up NASCAR hero Jeff Gordon in a licensing deal, but Papyrus, the official and longtime NASCAR licensee for the PC, has inked a deal with Bobby Labonte to become the company's spokesperson for its *NASCAR* racing series. Labonte won four races as a member of Joe Gibb's NASCAR Winston Cup team and placed 11th in the 1996 Winston Cup standings. He will represent Papyrus on its *NASCAR Racing Online* series as well as *NASCAR 3*, which is scheduled to ship towards the end of '98.

It's been a long time coming, gasp, but *Lode Runner 2* is officially in the works. GT Interactive has indicated the sequel will be developed by Presage, the codehouse responsible for the two-million-selling original. The PC and Mac game will be played from an orthogonal view (a la *Diablo*) and will feature sprite-based characters. The game is also expected to ship with a level editor and multiplayer capabilities.

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pissed off New York taxi cab drivers,
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and Sabrina Whitehead,
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Movers and Shakers

The business news that affects the games you play

Corporate sharks
take another bite

It glides through the firmament with gluttonous serenity. Its design is perfectly larcenous. It assimilates, expands, moves on. Resistance to GT Interactive is futile.

The latest but probably not the last victim is MicroProse. Once fresh-faced, vigorous, hearty, and sanguine in its independence. Now an ashen, mono-dimensional fragment of the gigantic GT collective. Well, perhaps not ...

The vision some commentators are conjuring up is one of an irresistible exodus towards a world of mega publishers, and all agree that this has got to be a bad thing.

It's generally assumed that the fewer publishers there are in this industry, and the larger they are, the worse it will be for games. We'll end up groping frantically in a terrible, pop-music-like void of bland, generic grayness. It is a valid fear. It may well prove to be accurate. But let's spend a few moments examining the evidence before flying into uncontrollable hysteria about the evils of faceless corporations controlled by Armani-clad automata.

Not including the Japanese hardware and software giants, the following companies are in the shark club — that is, they are at the party end of the food chain. EA and GT in the U.S., Eidos in Europe. Everybody else is lunch. The latest to appear, perfectly fricasseed in a souffle of share options and cash transfers, were Maxis (boiled to EA's delight), Singletrac (lean and tender, the way Mom used to make 'em), and MicroProse (All you can eat!).

Once digested, the theory goes that these entities lose their ability to function and simply become part of the host, relinquishing — element by element — their personality and form.

There are takeovers that are often held up as examples of how a unique culture can be undermined by the need for corporate homogeneity. EA's difficulties with Bullfrog founder Peter Molyneux are well-documented as a good example of small meeting big with appalling results. And yet you have to believe that Bullfrog, without Molyneux, will retain an independent voice through its style and feel of its games, if not through an actual voice, muted by corporate caution and muffled spin-doctory.

Origin has as much personality as ever, which is apparent through its easily recognizable product lines. You don't buy *Ultima* from EA. You buy it from Origin. EA just gets a slice of your money.

People could argue that EA's recent takeover of Maxis achieved the opposite of what commentators believe happens when a company is assimilated. In its independent form, Maxis was contemplating the development of so-so, also-ran products like racing games and realtime strategy ho-hums. EA scrapped all that and ordered Maxis to concentrate on its core business — *Sim City 3000*. Hurrah for EA. An alleged crusher of creativity actually squashed rampant me-too'ism.

EA has spent a lot of money creating separate brands from within its own self. Is it possible that the maker of EA Sports is in the business of trying to make all its elements act as one?

When you think of GT, an image comes to mind of eminently acceptable titles in populist genres. The platformer *Oddworld's Odyssey*. First-person shooters of the *Unreal* ilk and realtime strategy like *Total Annihilation*. GT is good at getting its affiliates to make games that we like, despite being very much the business community's software publisher.

Now it has added the dimension of so-called cerebral gaming, which MicroProse should bring. That is, heavy-duty strategy of the *Civ 2* fashion and hard-core military simulations. GT will be smart to use the MicroProse name, still widely respected, to market these games.

Let's take a look at Psygnosis. Sony is fastidious about its corporate image. And yet Psygnosis still manages to operate with more than a modicum of independent spirit. Sure, it's not as bellicose in its public attitude as before, but who really cares? The games are just as good as ever.

The "faceless suits" we are so happy to dismiss are by no means the perfect guardians of our favorite pastime. But to portray them as gray accountants with absolutely no feel for what the public wants is an injustice. That is the arena for lazy thinkers unable to get beyond sophomoric generalizations. Or worse, cynical hacks demonizing the business community for their own ends.

There are plenty of execs with limited imaginations who are unable to see beyond the latest bandwagon, and this industry is full of horror stories. But the same is true in the development and creative communities. And unfortunately, it is also true for us, the general public, apparently ever happy to consume swill.

Nevertheless, big publishers are at each other's throats, signing up small development houses. Creative autonomy for these pocket dynamos is being guaranteed by the publishing battle cruisers. Even if you assume that creative interference goes on, the developers are obviously wielding power of their own. Otherwise their independence wouldn't even be on the agenda. Even Molyneux and EA have cozied up, each recognizing the other's appropriate size. One a large and powerful publisher, the other a focused and talented developer.

Also, the idea of lots of small- or medium-sized publishers guaranteeing more creativity than a few large publishers has yet to be demonstrated. There are fewer publishers now than ever before. Are games worse now than they have ever been? It could be argued that the proportion of shit games has increased as the risks have increased, though that view is contentious and deserves more examination than it's being afforded here.

But it is no more wise to portray the coming together of corporations as a good thing as it is to declare it an automatic disaster. Publishing in this business now is impossible unless you are a large company with many resources. Which means that developers with original ideas cannot take the financial risk of publishing for themselves. They must persuade execs of their merits in order to get the execs to take the risks on behalf of their shareholders.

Many of these execs will not take a risk, knowing that risks are so called for good reason. But some execs will take risks because some of them know what they are doing. And let's remember that they're not gambling on a game. They're gambling on the public's acceptance of that game. The timidity of some execs could be based on their empirical belief that the public (that is, you and me) doesn't always recognize originality when we see it. And if we, the gameplayers, won't risk our money on something new and fun and different, we deserve all we get.

by **Colin Campbell**

Colin Campbell is **Next Generation**'s International Correspondent

Joyriding

Gaming on the Internet

Quake moves to the arcades — **and online**

It should almost go without saying that *Quake* is, for now, the best online game around. With mountains of modifications, Quakeworld, and thousands of available opponents in 32-player games, what more could you ask for? But at the same time, it is something of a shame that only a select

game will be in the full cabinets at the arcades to attract attention. Sensory overload is what the team is shooting for; in many ways, it has been achieved.

In addition to adding this eye candy, Hyperware has mixed up item and monster placement for single-player modes while also forcing the player's health to count down (arcade operators are adamant

by **Christian Svensson**

Christian Svensson is the editor of **Next Generation Online**

> ## When I first heard about the project, I was more than slightly skeptical of how adequate a transition *Quake* would make to the arcade

few (estimated to be approximately 120,000 people) have ever played the game online.

What about all of the people who can't afford Internet Service Providers, much less a decent PC to run it on? What about console gamers who have never looked to the PC as a means of blasting a friend with a rocket launcher? Oddly enough, some other companies have looked at exactly those markets and have decided that there is a viable customer base there. And where are they going to capture it? You guessed it: the arcade.

A joint project between Id Software, Hyperware, and Quantum 3D, in association with Intel's Open Arcade Architecture Forum, Location-Based Entertainment Systems is a new company with a simple goal: to take some of the best 3D technology (Quantum 3D's SB100 3Dfx-based hardware) with the best online multiplayer game around (Id's *Quake*), make some modifications to the game so it's slightly different from what you have at home (courtesy of Hyperware), toss the whole thing into an arcade cabinet with controls, and add a dedicated online backbone so that arcades around the country can compete against one another.

When I first heard about the project, I was more than slightly skeptical of how adequate a transition *Quake* would make to the arcade market. But when I showed up at Quantum 3D's offices, I saw a demonstration of *GL Quake* running at 800x600 at about 60fps with an incredible audio system. Plus, the team promises the

about that three- to five-minute play period per credit rule). Multiplayer deathmatches, which promise to be the most popular mode in arcades to feature the four-player setups, will happen in one of several specially created maps.

As mentioned above, one of the available configurations for arcade operators will be the four-player setups that will use Location-Based Entertainment's SparkyNet technology. Each pod has a Pentium II-based PC that's

equipped with a Quantum 3D SB100 accelerator and PCI 100Mbit Ethernet card, and each PC runs the SparkyNet proprietary network software. SparkyNet, in its most basic form, is based around a Windows NT network. A server at the location manages the entire local network while also housing game content, scores, revenue information, and even advertising rotation. The other key to the technology is that eventually, SparkyNet servers at different arcades will all be interconnected via a dedicated Internet backbone.

While still expected to be more than a year before the first arcade connections are made, Location-Based Entertainment is already speaking with MCI about

necessary connections. Location-Based Entertainment is eventually envisioning tournaments and activities between arcades in Texas and California being run over the backbone.

Quake will be the first game on these SparkyNet-based systems, but it won't be the last. Location-Based Entertainment is already working with MicroProse, GT Interactive, Ion Storm, Paradigm, TerraGlyph, and others to solicit content for the SparkyNet program. Whatever the next online gaming craze may be, it shouldn't matter, as the systems will be able to support them. Finally, consumers will be able to connect to the Web and check out a variety of gaming-related sites to find out the latest news and information.

The first units should be in a few select West Coast arcades by the time you read this, and the systems will undergo

> ## Sensory overload is what the team is shooting for; in many ways, it has been achieved

some serious testing and research. If all goes well, more widespread tests and even early distribution should begin in the first quarter of 1998.

While these systems aren't likely to hold much interest for hard-core online gamers (and Location-Based Entertainment willingly admits this), for those people who don't have access to PCs and/or the Internet, the SparkyNet systems may represent an excellent gaming experience that they'd be more than happy to pay for. At the same time, even for those of us who do have excellent gaming PCs, there's something to be said for seeing *Quake* running at such amazing resolutions and frame rates. ng

Retroview

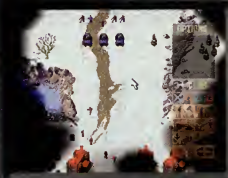## Anecdotes from computer and videogaming's past

The Dumb Shits Club

The people who designed such Atari classics as *Tempest* and *Asteroids* were like family. They partied together, ditched work together, and waged minor wars against the rest of the company together. There was no such camaraderie among the game designers in the division that made the games for the Atari Video Computer System (also known as the VCS or 2600). The members of that unhappy team were cliquish, divisive, and bound for riches.

Atari hired four people to design games for the VCS in 1977, then hired eight more programmers within a year. It didn't take long before friendships and rivalries formed within the division.

The most celebrated clique within the division included David Crane, Alan Miller, Larry Kaplan, and Bob Whitehead. Many people considered Crane and company to be Atari's most talented designers. While at Atari, Miller created *Surround* and *Basketball* and Crane created *Atari Football*.

A second clique included three less assuming engineers — Warren Robinett, Tom Reuterdahl, and Jim Huether. The most famous game to come from this group was Robinett's *Adventure*. The members of this group were less flashy than Crane and company, and a rivalry formed.

There really were two rival cliques when I was there. The guys who went off and started Activision, for some reason, were kind of a little clique, and me and my two friends, Tom Reuterdahl and Jim Huether, were sort of another clique.

— Warren Robinett

While tensions were already brewing among the programmers, some of Atari's policies added even more fuel to the department's unrest. Although their games started raking in large profits, Atari programmers generally made less than $30,000 per year. While Robinett and his group recognized that they were pretty underpaid, they decided that they still had "cool" jobs and simply grumbled among themselves. Crane, Miller, Whitehead, and Kaplan, on the other hand, deemed the situation less than acceptable.

We did all the implementation in those days, including the music and the graphics. We did the music, what little there was. I can't say I'm a great musician, but I like music a lot. I thought making games was a pretty creative, unique act that warranted compensation. I think I was making $27,000 or $30,000 a year at that time. It was not aggressive engineering compensation, frankly, even for that era.

— Alan Miller

The work became a little easier when Larry Wagner, the man heading the division, brought in a company artist named Marilyn Churchill to work with his game designers. But the game designers were still underpaid and received no ownership for their work.

Fearful that other companies might try to hire away his staff, Atari President Ray Kassar did not allow his designers to sign their names on their games. Crane and

by **Steven Kent**

A frequent contributor to **Next Generation**, Steven Kent is the author of a forthcoming book on the history of videogames

company, seeing themselves as something akin to rock stars, despised this policy. They had a public who loved their work, and they wanted credit for their games, so Miller came up with terms that he considered fair for his work and got his friends to join him: They would either be paid fairly and have their names on their games, or they would leave. The four men went to Wagner, who went up the chain of command until their demands reached the very top. When Kassar responded that he could get five programmers for the pay that each of these experienced programmers was asking for, the programmers made good on their threat. They left the company, found legal representation and financial backers, and formed Activision, the first third-party game company in the history of home game consoles.

Although Atari tried to stop Activision from publishing games for VCS with a series of legal suits, Crane, Miller, Kaplan, and Whitehead set up a game publishing empire. With such hit titles as *Kaboom!*, *River Raid*, and *Pitfall*, Activision grossed $50 million in its biggest year. Soon

thereafter, other Atari defections followed. In 1981, Atari Vice President of Marketing Bill Grubb quit his job and convinced several designers to join him. He founded Imagic (not to be confused with Interactive Magic), another extremely profitable company. Of the 12 original designers, only three remained at Atari — Robinett, Reuterdahl, and Huether.

Those of us who stayed at Atari called ourselves the Dumb Shits Club. They made $50 million and we made $20,000.

— Warren Robinett

Kassar did not loosen his hold on his remaining programmers as his other stars left. During the year and a half that Robinett remained at Atari, he saw friends leave to find better jobs elsewhere and enemies defect to become millionaires. In a humorous yet bittersweet act of rebellion, Robinett created a hidden room in *Adventure*, the last game he did at Atari. If players found their way into the room, they would see his name plastered across the wall in rainbow colors.

Shortly after finishing *Adventure*, Robinett quit his job and used his savings to travel through Europe. When he returned, he asked Bill Grubb for a job at Imagic. Grubb said yes, but not before insulting him for staying at Atari — and offering him the exact same wage he made there.

In the end, Robinett decided to work with three friends who had received a grant to create educational software. Robinett and his friends enjoyed their work so much that they continued developing education programs even after their grant ran out. Appropriately, they ended up calling their company The Learning Company. In 1996, The Learning Company, which was co-founded by Warren Robinett, one of the original members of Atari's Dumb Shits Club, sold for $500 million.

Although their games started raking in large profits, Atari programmers generally made less than $30,000 per year

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Motivate

As gaming continues to move forward into ever-more-detailed 3D environments, the ability to put increasingly realistic characters into games has begun to have a major impact on game design — as *Tomb Raider*'s Lara Croft has demonstrated rather dramatically. However, this realism has often been confined to a purely visual level. Sure, character X may look more realistic than ever, but he or she certainly doesn't act much like flesh-and-blood.

Which is one reason Motivate, "The Intelligent Digital Actor System," may represent an important step forward in the creation of interactive personalities. The entire suite of tools includes Motivate Development Environment, the character creation system; Motivate Runtime, a series of DLLs that allows end users to run a Motivate-created environment with their own engines applications; Motivate Server, which is used to establish multiplayer realtime 3D worlds; and the Motivate SDK, which enables the creation of custom Motivate players for use with other programs and also extends its functionality in other user-defined ways.

Motivate Development Environment is the heart of the system and where most of the work is done. Characters are created using 3D Studio MAX, which is the only 3D file format supported

directly — although the SDK could certainly be used to build a plug-in to support other formats if needed. Currently, Motivate is based on hierarchical character structures — ie., a separate wireframe for each section of the body. While bones-based, single-mesh deformation engines are beginning to creep into games like *Messiah* and *Half Life*, Motivate doesn't support such a system.

Nevertheless, this isn't much of a drawback, and within its chosen structure, Motivate excels, breaking things down into basic components and doing a lot of the work for the developer. The system is based around creating Skills, or simple keyframed animations, then stringing these together into more complex behaviors. Skills come in three different categories — Locomotion, Manipulation, and Basic, the latter being a catch-all for anything that doesn't fit the previous two. Most Skill animations require only a few keyframes and are generally quite easy to construct. (On a side note, the onscreen gadgets used for translation and rotation of models are among the most easy-to-use and intuitive we've used yet.)

Skills all come with their own parameters for relating to other Skills — a Skill called "Grab," for example, would be tagged to "Walk," so that if need be, a character would automatically use its walk cycle to cross a room towards the

Construct AI and character actions in real time, then see the results

The Motion Factory's Intelligent Digital Actor System is among the most powerful of its kind — for a price

desired object. Also, it wouldn't matter if the object were on the floor, a table, or behind something else. Motivate's own Inverse Kinematics engine and realtime logic control both the path taken and whether a character needs to bend over. This is controlled through the use of special objects called Handles, a kind of bounding box that is wrapped around objects to be manipulated and also the manipulating portion of the character, so that a hand (or tentacle, or whatever) can settle realistically around the object.

Once skills are defined, Motivate uses a Hierarchical Finite State Machine, a flow-chart-like graphical representation of actions, to string them together and create a character's overall behavior. The Machine uses a proprietary language called Piccolo (which is nearly identical to Java), to delineate both an action's parameters and the states that trigger it. Support is also given here for things like geometry or texture substitution, so a character can change expression, for example. These Machines can quickly become monstrously complex, but by focusing on each small portion at a time, it doesn't get out of hand.

The catch is the price, as amateurs need not apply: $25,000 for a five-seat license for the Motivate Development Environment, an additional $25,000 royalty fee for Motivate Runtime, another $25,000 for Motivate Server, and $5,000 for unlimited access to the SDK. However, as a professional development suite, this puts Motivate in roughly the same ballpark as Softimage, and not unreasonable. Just compare it with the cost of, say, licensing the *Quake* engine, and it's downright cheap.

Overall, the Motivate system does exactly what it claims to, and at this it excels. The learning curve is gentle (the provided tutorials are solid and easy enough to follow, although a little sketchy on the "whys" of doing things), and Piccolo is straightforward enough for anyone who's had Java or even Visual Basic experience. The idea of being able to construct AI and character actions in real time, then instantly see the results is intensely exciting, and Motivate pulls it off admirably. **ng**
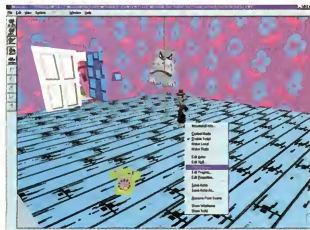
A simple wave requires only a couple of keyframes (top). The Hierachical Finite State Machine, using a scripting language called Piccolo, is then used to assemble complex behaviors (above)

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Arcadia

The latest arcade and coin-op news

Arcades **edge out routes** in video buys, **says WMS**

Many members of the arcade industry trace their roots back to mom-and-pop businesses that used to place *Pac-Man* coin-op videos in 7 Eleven stores. Traditionally this "street" side of the business has been the major customer for so-called arcade videogames. But in recent years an explosion in the arcade sector has taken place, led by massive international chains like Namco CyberStations. The new crop of supercades encompasses a new wave of Family Entertainment Centers that combine arcades with mini golf or go-karts to appeal to a broad demographic, plus upscale Location-Based Entertainment sites like Sega GameWorks and the Dave & Buster's restaurant/arcade/bar chain, which are aimed more at yuppies in their 20s and up (customers with money who have no kids or leave them at home).

Just how far this revolution has gone — so far — was reflected recently in the dry pages of a legal and financial statement filed with the U.S. Securities & Exchange Commission by Midway Mfg., America's leading coin-op game factory. According to their SEC document, arcades now absorb at least an equal share of the industry's videogame production ... and may actually be a larger market than traditional route operations. As the leading U.S. manufacturer of coin-op videogames, Midway has unquestioned credibility when it tells Uncle Sam that it "estimates that sales to route operators generally comprise between 45% and 50% of the coin-operated videogame market."

WMS report offers **revealing look at factory**

The SEC report filed by Midway's parent firm, WMS Inc., confirmed that a "successful" coin-op videogame launch (defined as at least 5,000 units sold) almost always translates into "at least" 100,000 sales of the home version of that title. WMS further advised that leading PC videogame maker GT Interactive has paid $35 million in licensing fees for rights to develop CD-ROM versions of WMS games for the PC (home) market. WMS also provided some eye-opening statistics, such as the fact that *Mortal Kombat* products of all sorts (including licensing and spin-offs) accounted for 22% of company revenues in fiscal 1997, as opposed to last year's 34%.

Konami debuts **"Cobra"** videogame system and unique **photo vender**

Konami of America's *Fighting Bujutsu* video upright made its U.S. debut at the AMOA Expo in Atlanta last October. Game features include the "Cobra" advanced videogame hardware system, which is capable of generating more than one million polygons per second. Cobra can also combine texture-mapping, motion-capture images, smooth camera rotation, and much more, resulting in visuals so lifelike that you can see a single raindrop falling, hitting the ground, and breaking up into a miniature shower of tiny droplets. The first game's fluid character motion is based on Konami's careful study and data capture of physical movements by real-life martial arts experts. Not only does the game feature stunning graphics, but gameplay is equally advanced. A wide menu of characters is available for head-to-head matchups on this two-player dedicated game. Artificial Intelligence, built into Cobra's programming, enables characters to "grow stronger," as if learning from experience with each fight. After several hours of gameplay, four hidden characters emerge, and all characters pick up speed, keeping the challenge high.

ESPN/Disney to create new **LBE chain;** also Sony/MWE

ESPN & Disney Regional Entertainment have finally made it official — their new ESPN Grill ultimate sports bar/restaurant/LBE will be a nationwide chain. The first site opened in Orlando, Florida; new units are planned for Baltimore (in 1998) and Chicago (1999). The companies are planning to roll out the concept in other major U.S. cities later, say execs. Nearly 100 yards across, ESPN Grill will feature a restaurant in an ersatz ESPN studio set; 16-foot TV screens for watching live sports broadcasts; and sports-themed game and simulator arcades. This LBE chain puts Disney into the third "branch" of 1990s funcenters; the company's also planning a chain of CECs (Club Disney) and FECs (DisneyQuest). By the way, the second Club Disney is set to open next month in West Covina, California, while its FECs will open in Orlando (summer 1998) and Chicago (1999).

Sony is also getting more aggressive about FECs and LBEs. It was recently reported on the Web that Sony said it would be a strategic partner in some LBEs planned for U.S. and Canadian mountain resort locales with Mountain World Entertainment (British Columbia). According to the report, the flagship site opens

by **Marcus Webb**

Marcus Webb is the editor of *RePlay* magazine

in Whistler, B.C., late this month, with both the parent Sony Corp. and its Canadian computer entertainment subsidiary aboard as sponsors. Sony will install high-tech audio and video equipment while Sony Computer Entertainment Canada will help build a sort of "home game arcade" featuring PlayStation consoles and associated titles. Virtual World Entertainment will provide linked simulators.

Dave & Buster's is at it again. Following announcements of huge licensing deals and overseas franchises in Asia and Europe, it has inked a deal with a top restaurateur licensing firm (ECE S.A. de C.V.) for five sites to open in Mexico over the next few years. The first D&B will open in Cancun in the third quarter of 1998, followed by Mexico City. Its new partner already holds exclusive Mexican rights to other name brands like Planet Hollywood and the Hard Rock Cafe.

Sega GameWorks says a new site is slated to debut this month in Tempe, Arizona, following the opening of its new Dallas-area store in Grapevine, Texas, last October.

CyberPort Niagara is a new $4.5 million "edutainment" FEC that opened last summer in Niagara Falls, Canada. It's owned by New Jersey-based Tellurian, Inc., a 10-year maker of computer image generators and VR games. The 40,000-square-foot, year-round attraction includes interactive simulators; displays of accurate replicas of space age and King Tut artifacts; displays of real Hollywood props and sets; an interactive "science circus"; kiddy play area; and VR arcade.

Regal Cinemas, owner of America's third biggest movie theater chain, has already moved aggressively into the FEC market by adding funcenters to its multiplexes. Latest wrinkle: This fall, Regal will open a big new Laser Trek laser tag arena from Heads Up Technologies, Inc., in its Chesapeake, Virginia, site called FunScape, which is attached to a 13-screen complex. Up to 36 players will be able to play at once. Laser Trek features hand-held lasers, computerized vests, and a radio frequency Local Area Network that gives players audio and visual status reports and coaching.

PLAYSTATION GAME CONSOLE
A. Prepare yourself for a blast of ultimate system power. **PLAYSTATION**

FINAL FANTASY VII
B. Ground breaking graphics and sounds. **PLAYSTATION**

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C. Crash into a whole new adventure and experience! **PLAYSTATION**

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D. Savage combat skills and omnious beauty launches you into a new realm. **PLAYSTATION**

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F. Takes sword fighting into a cinematic experience. **PLAYSTATION**
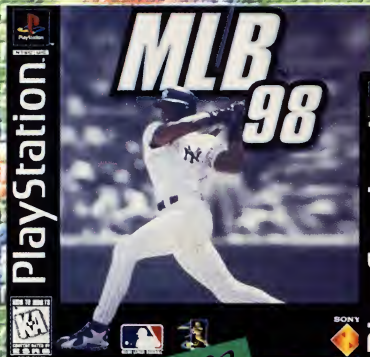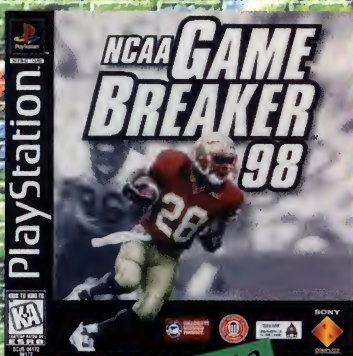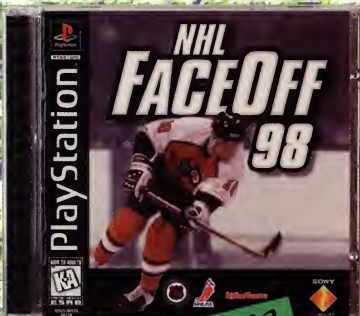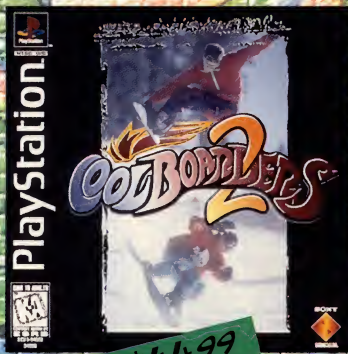
A. $149.99

B. $49.99

C. $39.99

D. $44.99

E. $39.99

F. $39.99

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A. Featuring bone crunching tackles, over the shoulder receptions, goal post dunking, bursts of speed and much more.
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Interplay
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C. The game that combines humor with gameplay.
PLAYSTATION

Interplay
CLAYFIGHTER 63 1/3
D. Cool 3D breakthrough environments, 12 kick-butt Clayfighters and face floating camera angles.
NINTENDO 64

Edios Interactive
TOMB RAIDER II
E. New moves, enemies and, of course, the unstoppable Lara Croft.
PLAYSTATION
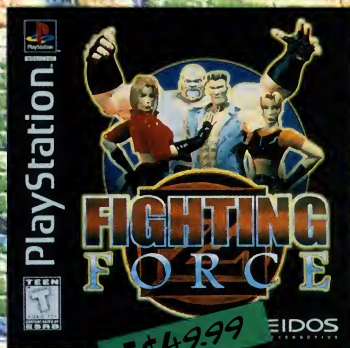
Edios Interactive
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F. Unparalleled action and hundreds of attack moves.
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F. $49.99

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A. A mini hand-held steering wheel that combines analog steering with digital control.
PLAYSTATION/NINTENDO 64

Interact
LIGHT BLASTER
B. The ultimate experience in real-action firing!
PLAYSTATION

Interact
BARRACUDA
C. Fully programmable with auto-fire and slow motion.
PLAYSTATION

Interact
MAKO PAD
D. Get ready to attack with auto-fire, slow motion and an extra long cord.
NINTENDO 64

A. $29.99

B. $29.99

C. $29.99

D. $29.99

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GX TV
A. Screen graphics, adjustable speaker doors and stereo surround sound.
ALL SYSTEMS

NYKO
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B. Maximum control for all your Playstation games.
PLAYSTATION

NYKO
COBRA LIGHT GUN
C. An accessory gun great for all shooting games.
PLAYSTATION/SATURN

MacMillan
MORTAL KOMBAT MYTHOLOGIES GUIDE
D. Blow-by-blow overview detailing non-stop fighting action MK fans expect.
BOOK
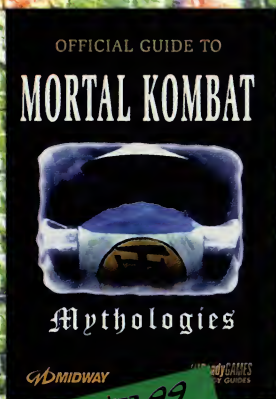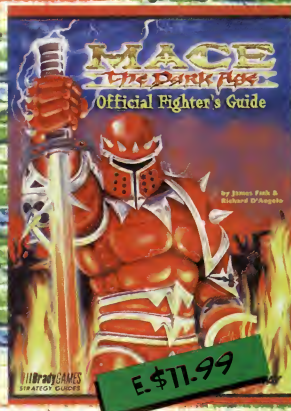
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E. All the strategies and secrets for Mace.
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F. Full layouts and tips for the mega-hot Final Fantasy VII.
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the Dark Age
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by James Falk &
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BradyGAMES
STRATEGY GUIDES
totally unauthorized guide to
resident evil
Director's Cut
Covers Playstation

G. $7.99

NG: So your goal is to get more and more people spending more and more of their free time playing with interactive entertainment?

Phil: Absolutely, yes. One of Sony's fundamental goals over the coming years is to establish legitimate forms of entertainment that are far removed from the games that we are raving about today. Then we will have consumers who look at their PlayStation as a totally different form of entertainment device. Perhaps they won't even know that, say, *GameDay 2000*'s out, and perhaps they won't even care, even though *GameDay 2000* will be huge within its core audience.

I'll give you an example of what I'm talking about. Entertainment with a CD player to you might mean *The Ramones Greatest Hits*, but to me it means a totally different type of musical entertainment. To my dad it means classical music. You know, he stares with slack-jawed horror at most of the contemporary music that makes up today's Top Twenty, but that doesn't mean he doesn't buy music. He buys software, it just happens to be a radically different form of entertainment to what I consider to be entertainment.

I think that we will see PlayStation evolve into a multi-use device that isn't inherently linked to one form of entertainment or another. In fact, this is one of the reasons why we do not bundle any software with the PlayStation hardware and one of the reasons why the box is rather neutral. The box for the hardware doesn't shout one particular form of entertainment or another. It's a player for all sorts of entertainment rather than a hardware device that you happen to get with a character-based action game.

NG: But the overwhelming majority of PlayStation's titles are driving, shooting, fighting, and guiding-a-marsupial-"with-attitude"-through-a-fantasy-world games. How do you plan to expand the library to incorporate a broader base of themes?

Phil: Well, first of all, nobody should belittle the significance or importance of driving, shooting, fighting, and guiding a marsupial through a fantasy world. These games are bastions of our marketplace and will continue to be very significant portions. Our job now is to grow the PlayStation appeal beyond the core gamer without alienating or losing the core gamer.

One example is *PaRappa the Rapper* — a software type that is just one tiny step down the road towards new forms of entertainment. It sticks out like a sore thumb right now when compared to the fighting, driving, and action games that are traditional in the marketplace. But two, three, or four years from now, these new forms of entertainment won't stand out quite so obviously because they will become more accepted by a new and very, very interesting marketplace.

NG: Just to finish, you have to admit that one day the original PlayStation's technology will become outdated. Hypothetically speaking, what kind of specs will a machine have to boast if it is to succeed in the next generation of consoles?

Phil: Well, there is a checklist of technology that everybody seems to talk about at the moment. This stuff is considered cutting edge now, but we know, from Sony's view of the world, that it will appear old hat very quickly. So anybody who tries to place a stake in the ground today and predict the future has got to be very brave indeed. And I'm not gonna be first to do that.   ng

America's Elite

The definitive portrait of gaming's most important people

Next Generation presents a landmark look at the people who shape the North American game industry — the most important market in computer and videogames

Games are a global industry, but ultimately, North America represents the lion's share of potential sales for both hardware and software. And who are the most important people in the American game industry? The people in this feature.

These are the individuals who represent the guiding lights and the face of power in an industry that, at times, can seem as unstable as a toddler in an earthquake. Their companies are responsible for the monumental products, decisions, and trends that make the industry grow. They are the industry's most influential forces, and collectively they hold the key to the future of games. Finally,

they are often the people hidden from the public eye (Dave Perry excepted), spending more time making things happen than posing for the camera or doing interviews. And therein lies **Next Generation's** motivation for creating this feature — to give credit to the people responsible for making the industry move.

And for those who question our choices, remember, our selections represent an instant in an ever-changing industry (it's even possible any one of these players may switch teams before this article is printed). If we were to do this again in six months or a year's time, the list might be very different. But today, in January 1998, these are the American game industry's most important people.

Rafael Fuchs:

Israeli-born, Fuchs studied photography in Jerusalem before moving to New York in 1985. He has photographed many celebrities and corporate figures, including actors Eric Stoltz and Nathan Lane, talk show hosts Larry King and Ricki Lake, and Colin Powell, former chairman of the Joint Chiefs of Staff. His work has appeared in such publications as *Newsweek*, *Time*, and *Esquire*.

The leader

John Carmack
Technical director
Id Software

Career highlight: building the engine that created the *Doom* genre
Career lowlight: Doom 2

(Mesquite, TX — October 23)
The toughest thing about John Carmack is picking which career
highlight to call out — creating the 3D game genre, *Wolfenstein 3D*,
Doom, Quake — any of these would suffice. A self-described
"technology idealist," it's hard to engage him in conversation until you
hit a hot spot — OpenGL versus D3D, for example. Through the success
of the *Quake* licensing initiative, his work is actually more important to
the industry now, with legions of "next Carmacks" trying to equal his
impact. Expect the decisions he makes on his next project *Trinity* to have
far-reaching effects on everything from the next generation of 3D cards,
to what APIs other developers will be using, to possibly even the feature
set of Microsoft's future versions of DirectX.

Biggest challenge in 1998: a Trinity-based game for Christmas?
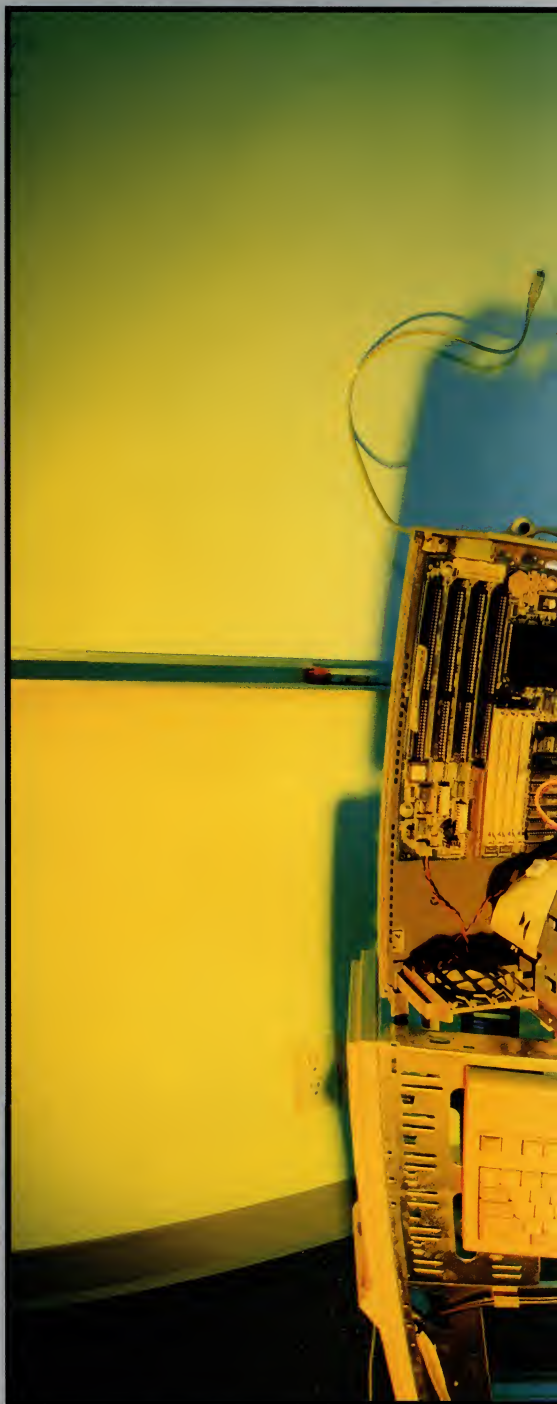
Reconstruction
Bernard Stolar
**Chief operating officer
Sega of America**

Career highlight: the *Mortal Kombat 3* exclusive for PlayStation
Career lowlight: the Saturn comeback

(Redwood City, CA — October 16)
As head of third-party relations at Sony, Stolar was instrumental in securing exclusive software support for PlayStation. His defection to Sega sent major waves through the industry, but the planned revitalization of Saturn never happened. With almost no third-party support left for Saturn and only a few Sega titles slated for 1998, Stolar's current workload is focused on building developer support for the Dural platform. At this point, bringing Sega back from the brink could take a superhuman effort — but that's exactly the kind of thing for which Stolar has become known.

Biggest challenge in 1998: garner enough third-party support for Dural to ensure it fares better than Saturn

High roller

Brett Sperry
President
Westwood Studios

Career highlight: Command & Conquer
Career lowlight: sold Westwood to Virgin too soon, for too little money

(Las Vegas, NV — October 22)
Las Vegas-based Westwood Studios gave birth to the realtime strategy genre with *Dune II* and took it to the next level with *Command & Conquer*. Sperry's latest gift to gamers? *Blade Runner* — which proves that Westwood is continuing its quest to push gameplay and technology to new heights. Expect other industry players to keep looking to Sperry for creative direction — whether they admit to it or not.

Biggest challenge in 1998: keeping Westwood Studios intact no matter what happens to Virgin Interactive

Life on the inside

Kelly Flock
President
Sony Interactive Studios America

Career highlight: GameDay series
Career lowlight: Sony Imagesoft

(Foster City, CA — October 16)
A few years ago, Sony Imagesoft was a laughing stock, producing such forgettable titles as *Hook* and *Johnny Mnemonic*. Then came PlayStation, and suddenly Sony's internal development studio was faced with the challenge of matching the first-party efforts of Nintendo and Sega. Thanks in no small part to Kelly Flock's leadership, the renamed SISA rose to the challenge, especially in sports games, stealing the football throne from EA and delivering serviceable baseball and hockey titles. Flock has a good sense of humor and a dedication to his craft — things he'll need as SISA takes its first steps towards becoming a well-rounded development house. For now that SISA has nailed down the formula for successful sports titles, it needs to focus on other important genres to stay on top. But Flock seems well aware of this. At the end of his brief photo shoot, he thanked the photographer for being "professional," by which he meant "fast" — a clear indication of a man with a busy schedule. Not bad for a guy whose first job in the game industry was building boxes at EA's packaging plant.

Biggest challenge in 1998: beat EA Sports in hockey and baseball; bring a great nonsports title to market

Father figure

Ken Kutaragi
Chairman and CEO
Sony Computer Entertainment America

Career highlight: PlayStation
Career lowlight: PlayStation — the Super NES add-on

(Foster City, CA — October 16)
Ken Kutaragi led the effort to create a CD-ROM add-on for Super NES. When Nintendo killed that effort, he looked five years ahead, decided 3D was the future, and while his contemporaries at Sega, Atari, and 3DO were creating great sprite engines, he built what was at the time the most powerful, low-cost 3D generator on the planet. Since then, he has moved on to management (while still keeping an interested eye on, and some say hand in, development), taking control of SCEA, a post that puts him second only to Terry Tokunaka, head of SCEI in Tokyo. The added responsibility hasn't hurt his good nature, though — when he saw his test photos, he insisted on changing the entire arrangement of the shoot. Why? "These pictures look too serious!"

Biggest challenge in 1998: to keep people believing in PlayStation as cutting-edge technology after four years

Up close and personal

Phil Harrison
VP of third-party relations and R&D
Sony Computer Entertainment America

Career highlight: approved *Final Fantasy VII*
Career lowlight: approved *Fantastic Four*

(Foster City, CA — October 16)
After a stellar rise at SCE Europe, Harrison (who's only 27) was appointed as Kutaragi's right-hand man at SCEA. It wasn't luck that put him there — as our interview this month shows, Harrison is articulate and intelligent, and has a keen eye for the future (he's also adept at dodging questions he doesn't want to answer, on the record anyway). Ultimately, he's responsible for the contents of every game released for PlayStation in the U.S. Whether it's a new set of programming libraries from Japan on its way to U.S. developers or final code for a third-party game, it all passes across Harrison's desk.

Biggest challenge in 1998: convincing third parties to continue developing for PlayStation as more powerful systems appear on the horizon

The operator
Byron Cook
President
Midway Entertainment

Career highlight: Mortal Kombat
Career lowlight: Mortal Kombat

(Corsicana, TX — October 24)
Byron's father Leland began his career as a vending route operator, later founding the arcade outfit Leland Corp., which merged with Tradewest in the mid-'80s. It was Williams/Midway's acquisition of these companies that brought Byron into the WMS fold. And now, even in the face of declining arcade revenues, Midway Home Entertainment (which was spun out of WMS) and subsidiary Atari Games have produced some amazing titles of late — *San Francisco Rush* chief among them. A native Texan, Cook walks with a swagger and talks with a thick accent. By all accounts, this is the way he runs his business — maybe that's why Midway is the only major U.S. player left in the cutthroat arcade business.

Biggest challenge in 1998: maintain Midway and Atari's recent arcade success

First-personal gaming

Scott Miller
President
Apogee

Career highlight: Duke Nukem 3D
Career lowlight: Rise of the Triad

(Garland, TX — October 23)
What does Id see when the lights go out? Scott Miller and the rest of the Apogee/3D Realms team. That may be overstating the case a little — but not by much. Among the enormous family of first-person shooter developers, there are only two companies that matter — one made *Quake* last year and the other *Duke*. And although Miller has seen steady defections from his crew over the last year and has even gone with Id's *Quake* engine for *Duke Nukem Forever*, his company still continues to innovate with new technologies like *Prey*'s Portal engine. But despite Apogee's explosive growth, some things never change — visitors to the office are often greeted by Miller's mom. "My first employee," he proudly boasts.

Biggest challenge in 1998: demonstrate that 3D Realms still has it by making *Duke Forever* a hit

Lord British
Richard Garriot
Senior VP and executive producer
Origin

Career highlight: the *Ultima* series, excluding *Ultima VIII*
Career lowlight: Ultima VIII

(Austin, TX — October 20)
Origin's tag line is, "We create worlds." A more accurate description might be, "Richard Garriot creates worlds, and then we publish them." Garriot wrote *Ultima* in BASIC; now *Ultima Online* is the most ambitious of all the persistent online worlds. Between these two projects, the *Ultima* series has embraced almost every gameplay and technological innovation possible. Although many others have contributed to the series' success, the final arbiter of all things Britannia is Garriot. He even goes so far as to place himself in his games as the character Lord British (he was actually assassinated during the beta test of *Ultima Online*). His personality and eclectic tastes are as much a part of the Origin legend as his games. "You'd be surprised how often I end up wearing this," he said of the period costume he donned for us inside his castle-like mansion. Actually, we wouldn't.

Biggest challenge in 1998: make everyone forget about *Ultima VIII* with *Ultima IX*; get the malcontents on *Ultima Online* to stop whining (good luck)

In the game

Larry Probst
Chairman and CEO
Electronic Arts

Career highlight: strongest brand names in gaming (EA Sports, Origin, Bullfrog, Maxis)
Career lowlight: Madden '96 not shipping

(San Mateo, CA — October 15)
Many assumed that when Trip Hawkins left for 3DO, EA's best days were behind it. However, under Larry Probst, the company has continued to excel in the two things it has always done well — pioneer new strategies, then exploit them better than its competitors. The first to publish games developed out-of-house, it was also the first to acquire other companies without assimilating them. This strategy has paid off — the independence given acquisitions like Bullfrog and Origin has resulted in games that have earned both critical and financial success.

Biggest challenge in 1998: keep EA Sports' current implosion from permanently damaging the brand's reputation for quality

Inside Intel

Jon Khazam, director of graphics
Alex Peleg, computer architect, MMX technology
Dave Sprague, graphics system architect
Jim Hurley, senior graphics researcher
Jason Rubinstein, games evangelist
Intel

Career highlight: Pentium II/AGP integration
Career lowlight: late with I740 3D technology

(Santa Clara, CA — October 15)
Intel may have been formed on the strength of just two people — Gordon Moore and Robert Noyce — but with 61,000 employees and net revenues of more than $20.8 billion, these days it's all about teamwork. This is the group (clockwise from far left: Alex Peleg, Jim Hurley, Jon Khazam, Jason Rubinstein, Dave Sprague) that's trying to make sure the best games are being optimized for Intel technology. Its weapons? MMX technology and AGP. With more than two billion dollars a year invested in R&D, Intel should have a good chance at delivering what developers — and gamers — want.

Biggest challenge in 1998: maintain dominance

Power trio
Howard Lincoln, chairman
Peter Main, VP of marketing
Minoru Arakawa, president
Nintendo of America

Career highlight: made Nintendo 64 a success in the U.S.
Career lowlight: failed to stop Virtual Boy

(Redmond, WA — October 17)
Howard Lincoln (right), Minoru Arakawa (left), and Peter Main (center) have done in the U.S. what Nintendo has failed to do in Japan and Europe — make Nintendo 64 an unqualified hit. While the post-launch months were AAA-title poor, the system now boasts a small yet solid library of four- and five-star games (notable exceptions: the fighting and sports genres). With Nintendo's combination of quality first-party titles and carefully targeted (squarely at 12-year-olds) marketing, it's not surprising that this is the same team that saved the U.S. videogame industry in 1985 with the NES. Nintendo has a well-deserved reputation as a conservative company, but in person, Lincoln, Main, and Arakawa are not the "suits" one might expect. Presented with a pack of Nintendo playing cards (the company is still Japan's leading producer of both Western and traditional hanafuda cards), they quickly got into a raucous game of five-card stud — although some of the smiles might have been because the money on the table was Next Generation's (they gave it back).

Biggest challenge in 1998: release decent 3D fighters and sports titles on Nintendo 64

The old school
Brian Fargo
Chief executive officer
Interplay

Career highlight: Descent
Career lowlight: Clay Fighter 63 1/3

(Irvine, CA — October 21)
Fargo and company have been around since the beginning. As the developers of
Bard's Tale and *Wasteland* on the Apple for EA, Interplay is on pretty safe ground with
its "By gamers, for gamers" tag line. Lately his company has been best known for its
ownership of Shiny, *Star Trek*-licensed properties, and most recently, the impressive
unofficial sequel to *Wasteland*, titled *Fallout*.

Biggest challenge in 1998: expand into console publishing in a serious way

Getting to know you

Dave Perry
President
Shiny Entertainment

Career highlight: Earthworm Jim
Career lowlight: Shiny's continuing inability to ship Wild 9s

(Laguna Beach, CA — October 27)
What, Dave Perry in **Next Generation** again? Yes, and not just because he agreed to take off his shirt for the shoot. And what about the leaf that reads "Dave"? Let's just say he likes people to know who he is. His shameless self-promotion might be more irritating if he wasn't right so often about gameplay and technological developments. After a massively successful stint at Virgin creating side-scrollers, he founded Shiny, created *Earthworm Jim* (with Doug TenNapel, now of the Neverhood), and got enticed by the management and licensing side of the business — to the detriment of his teams' success. The *MDK* team's departure to form Planet Moon may have been a wake-up call. Perry's taking a renewed interest in development, and Shiny's newest projects, *Messiah* (NG 33), *Fly by Wire* (NG 34), and the still well-shrouded *Sacrifice*, look invincible.

Biggest challenge in 1998: get *Wild 9s* out the door; convince Brian Fargo to release *Fly by Wire*
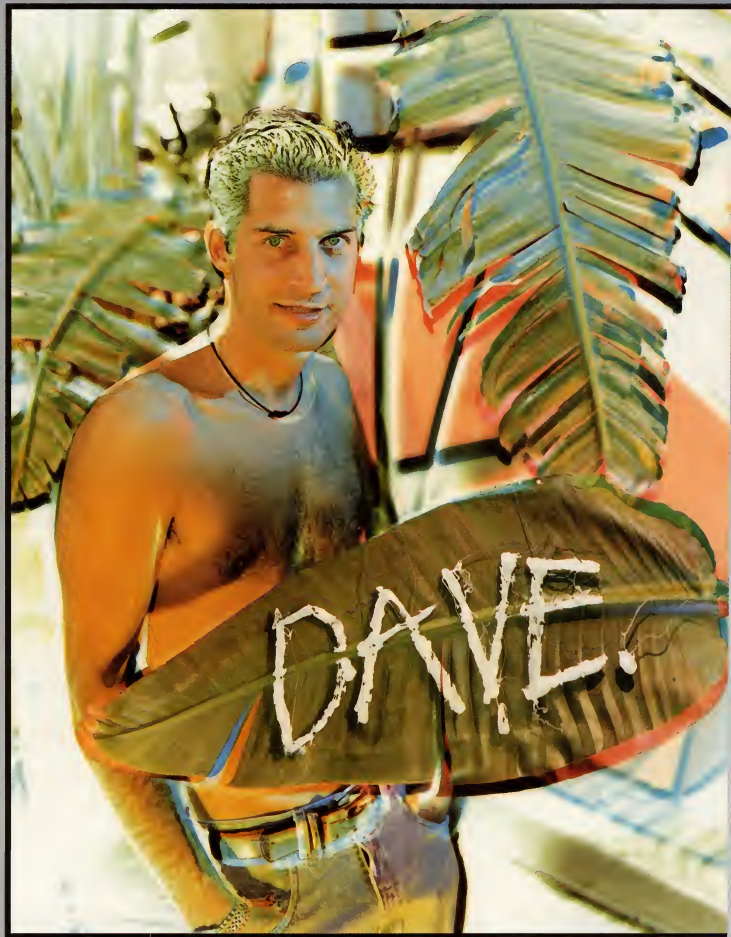
Alternate game plan

Brian Farrell
President and CEO
THQ

Career highlight: 11 straight profitable quarters
Career lowlight: a lot of it was thanks to the WCW license

(Calabasas, CA — October 21)
Brian Farrell ignores conventional videogame marketing wisdom. He doesn't invest big sums or expect big hits. He's willing to publish games on "orphan" systems like Game Gear. He doesn't pander to the press. He tries to appeal to "Middle American" tastes with plenty of wrestling and fishing games. What's it gotten him? Eleven straight quarters in the black. What does it prove? You don't need to be EA to succeed. By being smart — knowing the target market, picking a good niche, acquiring the right products — profits in the game industry are yours. We don't always agree with THQ's taste in games, but we hold them up as proof that small companies can succeed brilliantly in this business.

Biggest challenge in 1998: not letting THQ become a victim of its own success. The word is out on the "THQ model." Expect others to crowd the space soon

The direct approach

Kevin Dallas
Group product manager, DirectX
Microsoft

Career highlight: DirectX 5.0
Career lowlight: DirectX 3.0

(Redmond, WA — October 17)
For years the PC development community has longed for a stable and reliable suite of APIs for Windows machines. With the release of DirectX 5.0 last August, Kevin Dallas and the DirectX team at Microsoft have finally largely delivered on their promise of a high-performance, easy-to-use API set. Having been on the DirectX project for more than a year, Dallas has seen the company through the development and release of DirectX 3.0 and now 5.0 (Microsoft opted not to create a version 4.0). And while the process that took the project from DirectX 1.0 through 5.0 has been a long and sometimes painful one, both Microsoft and developers seem to agree that the results were worth the wait.

Biggest challenge in 1998: making DirectX work with Windows 98 while continuing the improvements that have become expected

Special fx
Greg Ballard
**President and CEO
3Dfx**

Career highlight: by all indications, Voodoo^2
Career lowlight: greenlighted Capcom USA's
Fox Hunt

(San Jose, CA — October 15)
If there was a list of the nicest people in the
game industry, Greg Ballard would certainly be
near the top. His ability to drive a hard bargain
among friends has served his company well. He's
successfully convinced developers to write to the
company's proprietary Glide API; board makers to
include 3Dfx technology in their products;
investors to keep the cash flowing; and, of
course, consumers to buy 3Dfx-enhanced games.
Despite a software-heavy resume (his two
previous stints were at Capcom USA and Digital
Pictures), he's thrived in the cutthroat world of 3D
accelerators largely because of the quality of the
Voodoo chipset. That's thanks to the two men
pictured in the tree with him, Gary Tarolli (left),
VP and chief scientist, and Scott Sellers (center),
VP of R&D.

Biggest challenge in 1998: make sure that
Voodoo^2 stays three or four steps ahead of the
competition

Judge and jury

Pete Roithmayr, director of buying, videogame software

Jerry Madaio, director of buying, PC software

Jeff Griffiths, senior VP of merchandising and distribution
Electronics Boutique

Career highlight: Final Fantasy VII and *Resident Evil* preorder campaigns
Career lowlight: ordering any copies of *Fantastic Four*

(Philadelphia, PA — November 3)
How does the retail world decide what games to buy? By looking over the shoulder of Electronics Boutique. There is a direct and dependable correlation between how a game sells in its first three weeks at EB and how well it will sell everywhere else throughout its life span. That's why companies like Eidos spend as much time courting EB managers as they do the press. The men who make the initial decision on a game, a decision that can make or break the game's financial success, are Pete Roithmayr (center), Jerry Madaio (left), and Jeff Griffiths (right).

Biggest challenge in 1998: make sure the free gifts don't cloud their judgment

Big business

Ron Chaimowitz
President and CEO
GT Interactive

Career highlight: Doom, Quake, Duke Nukem
acquisitions
Career lowlight: Bug Riders

(New York City, NY — October 31)
The man responsible for launching the careers
of Gloria Estefan and Julio Iglesias at CBS Records
International now heads everything from distribution
to product development at GT. At a
time when most companies are pulling back from
wild growth patterns, GT Interactive seems
determined to dominate the ranks of publishing
superpowers — a feat well within its reach. GT
Interactive was spawned from Good Times Video, the
company responsible for everything from releasing
Hollywood classics on video to Richard Simmons'
series of exercise tapes. Under Ron Chaimowitz's
direction, the company can attribute its overnight
success to two things — powerful distribution
channels into mass market retailers (thanks to the
video business) and high-profile product acquisitions
like *Doom, Hexen, Duke Nukem,* and *Quake.*

Biggest challenge in 1998: filling the hole left by Id
leaving for Activision

A new superpower

Mike McGarvey
Chief operating officer
Eidos Interactive

Career highlight: Tomb Raider
Career lowlight: The Incredible Hulk

(New York City, NY — November 3)
For years, when people thought of videogame characters, they thought of
Mario or Sonic. But then a new figure appeared — one that was tough, smart,
and decidedly grown-up. Lara Croft and the *Tomb Raider* series will forever
stand as the symbol of 32-bit gaming. But the man responsible for turning
Tomb Raider from just a game into an American phenomenon is Mike
McGarvey. And Eidos has far from finished growing. By acquiring
development talent like Core, Looking Glass, and Ion Storm, Eidos has
ensured for itself a future of quality games and prosperous returns.

Biggest challenge in 1998: prove that Eidos is not a one-hit wonder

Strategic planning
Sid Meier
Director of creative development
Firaxis

Career highlight: Civilization
Career lowlight: we're stumped. *Floyd of the Jungle?*

(Hunt Valley, MD — October 30)
From *Civilization* to *Gettysburg*, Sid Meier has long been America's most impressive home-grown design talent. His dedication to making the games he wants to make has consistently resulted in the highest-quality, intellectually challenging games. *Gettysburg* is the perfect example — based on his fascination with the battlefield diagrams in a children's book, the game makes the most of a limited concept through flawless design and execution. Meier, thankfully, shows no desire to move to the corporate side of things — Firaxis was founded as his tool to develop games without interference while others (EA) handled everything else. It's just good to know that someone out there is challenging the standard notion of what a videogame should, or even worse, has to be.

Biggest challenge in 1998: top himself, again

To the rescue
Bobby Kotick
Chairman and CEO
Activision

Career highlight: saving Activision
Career lowlight: giving Bruce Willis company stock to appear in *Apocalypse*

(Santa Monica, CA — October 27)
Bobby Kotick and his team saved Activision from bankruptcy in 1991. And while the road back to prosperity for *the* original third-party developer hasn't been without its bumps, the company has produced a steady stream of hits — *MechWarrior, I-76,* and *Dark Reign* among them. The company is a bit shaky on the console side, with *Apocalypse* rumored to be on indefinite hold, but Kotick still believes strongly in moving the industry forward, as the forthcoming *Battlezone* demonstrates. This ideal makes Activision a company to watch in both the action and adventure genres.

Biggest challenge in 1998: make fewer big promises and more good games

Yes m'lord
Allen Adham
President
Blizzard

Career highlight: WarCraft 2
Career lowlight: Battle.net hacked in three days

(Irvine, CA — October 21)
Adham had a simple strategy when he founded Blizzard: Start small, make good games, and wait for success. It worked. *Dune II* may have started the realtime strategy ball rolling, but *WarCraft* made gamers take note. And when everyone was ready to pigeonhole the company as a strategy-only shop, along came the *Gauntlet* for the '90s: *Diablo*. Adham's humor and lighthearted approach even come through in Blizzard's interior decorating — just inside the front door is a giant Orc and a fun-house-style room of mirrors.

Biggest challenge in 1998: expand into other genres

Everyman
Hard-core gamer

(New York City, NY — November 3)
This could be, without a doubt, the most important person in the videogame industry. For without you, the consumer, there would be no industry. Next month, **Next Generation** pays homage to the enthusiast and dares to ask the question: Are you a hard-core gamer?

The summit

A recent CEO round-table discussion sponsored by Imagine Media, Inc. (parent company of **Next Generation**) found several of our featured industry power players taking 24 hours to meet with other industry leaders, setting aside their business rivalries to discuss the current health and future of the industry. Although the content of the summit was off-the-record, **Next Generation** gave a presentation on several key issues that affect the game industry today, including the next generation of systems, creativity in game design, and online, multiplayer games.

1 Brian Fargo
  (Interplay)
2 Jim Barnett
  (Accolade)
3 Jon Richmond
  (Fox Interactive)
4 Larry Probst
  (EA)
5 Greg Fischbach
  (Acclaim)
6 Bobby Kotick
  (Activision)
7 Jack Sorensen
  (LucasArts)
8 Mike Brochu
  (Sierra On-Line)
9 Martin Alper
  (Virgin Interactive)

Towards reality
The rise of 3D gaming

Since the dawn of videogaming, programmers have attempted to tap into the aesthetic and gameplay possibilities of the third dimension. But it's only recently, with the advent of 32- and 64-bit consoles and technological developments like 3Dfx, that true 3D games have become a reality. **Next Generation** traces the rise of 3D gaming, looks at its problems and possibilities, and analyzes the implications for the future of videogames …
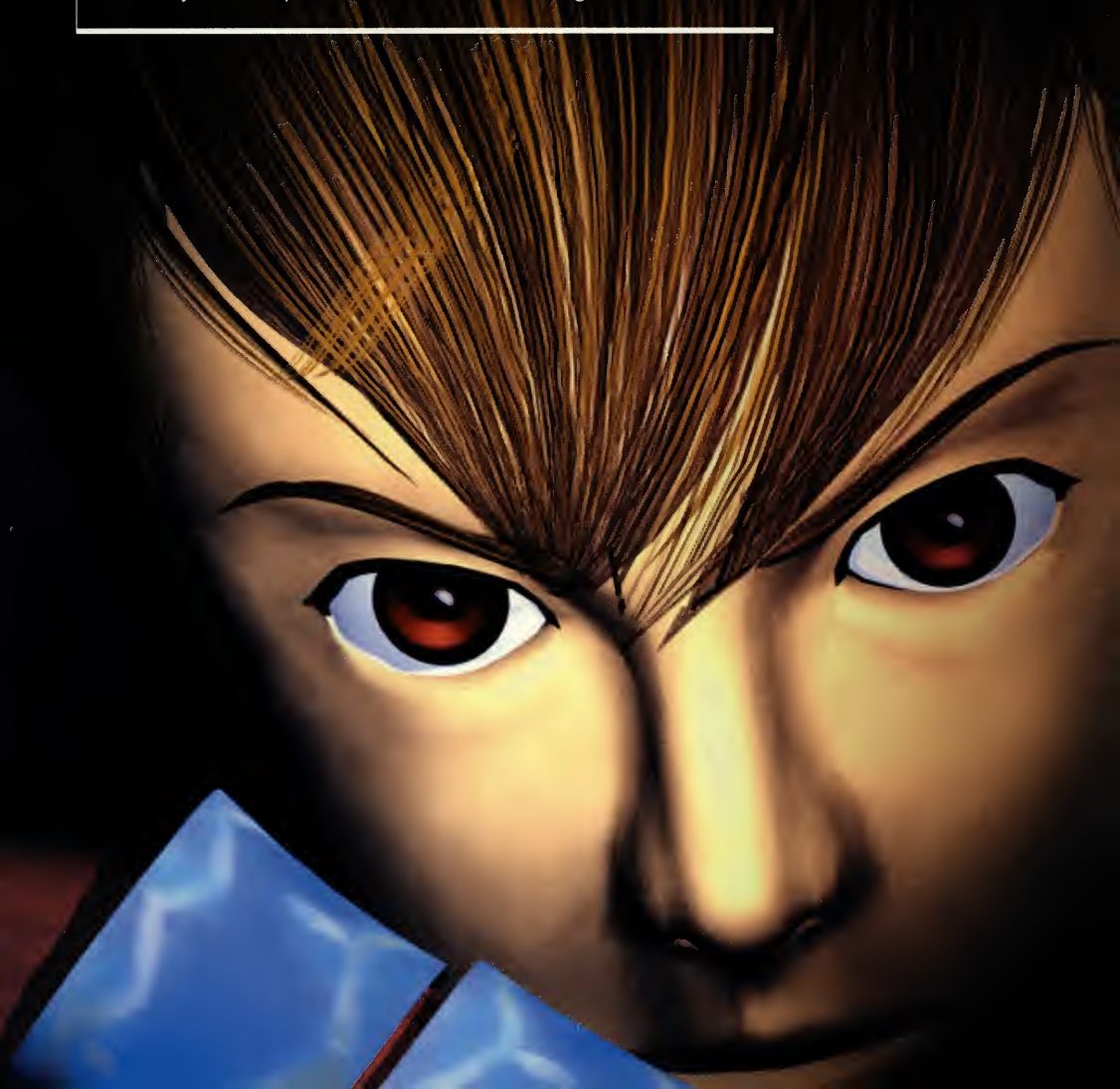
I f there is such a thing as a videogame Holy Grail, it is not greater interactivity or improved design, despite what certain game-design gurus would have gamers believe. Instead, for better or worse, the perennial object of desire for developers and gamers is the creation of realistic 3D worlds. The crucial extra dimension is the key to a whole new breed of game.

Almost as soon as computer screens were capable of generating realtime images, coders were experimenting with crude ways of simulating three dimensions, be it a triangular set of blocks to imitate the perspective of a road stretching to the horizon, or spaceships composed of progressively larger character squares to imitate 3D scaling. The arrival of vector-based displays in arcades at the dawn of the '80s added more fuel to the fire. The most memorable of the proto-3D titles that appeared around that time was *Battlezone*. With its wireframe tanks composed of little more than a dozen faces, it looks laughably crude now, but back then, the ability to move freely over flat terrain and battle enemies that attacked from all points of the compass excited gamers, many of whom regarded *Battlezone* as more of a simulation than a regular coin-op (indeed, the Army commissioned a special version from Atari to train Bradley Fighting Vehicle drivers). The vector graphics format was to provide the basis for several more successful 3D titles, including the seminal *Tempest* and *Star Wars* titles.

Even early home computers managed, with varying success, to provide the illusion of 3D. The Apple II, with a screen resolution lower than that of a single texture on the average 3D PC title now, gave the gaming world *Wizardry*, viewed by some as the true precursor to *Doom*. Another early 3D PC effort was *3D Monster Maze* from U.K. developer New Generation Software, which went on to create several equally ambitious games for the Sinclair Spectrum, including *Knot in 3D*, a landmark title blighted by the inability of most players to think in terms of three dimensions fast enough. Vector-emulating wireframe titles went on to make a significant impression on such home computers as the Apple II and C64, with homages to the *Star Wars* arcade game that proved particularly popular, along with RPG/shoot-'em-up *Elite*.

"Fake" 3D was the main currency in the early '80s, though. Many coders realized that by increasing the size and detail of a sprite, they could simulate movement in and out of the screen — the actual game mechanics and calculations taking place in the background were as simple as ever. This fake 3D method was perhaps most memorably employed in *Space Harrier*. Forced isometric-viewpoint titles also flourished, spurred on initially by the success of arcade game *Zaxxon*.

Programmers soon optimized their code to feature solid rather than wireframe polygon-based 3D in games, with flight sims providing the most effective demonstration that this approach was more convincing. But it was the simultaneous arrival in 1992 of *Ultima Underworld* and *Wolfenstein 3D* for PC that changed the face of 3D gaming. For the first time, texture-mapping on polygons was integral to game design rather than merely being a gimmick, enabling both titles to depict indoor environments with a sense of depth that was wholly convincing. Origin's

When *Tomb Raider* was created, its animators never figured systems would be able to do more than 30fps — run it with Voodoo[2] and everything moves too fast

Underworld was actually the more visually rich of the two, using uneven rather than flat ground detail. But it was the shockingly simple yet effective shoot-'em-up format wrapped around Id's first 3D engine that went on to spawn a whole new breed of 3D games and set the first of the company's benchmarks for other game designers. As John Carmack, author of *Wolfenstein*'s engine, says: "It was the dawn of the 3D age."

Quaking all over
It was Softdisk's *Catacombs 3D* that gave Carmack his first opportunity to work with 3D. Although the techniques he learned on that game were applied to *Wolfenstein*, he decided to start again from scratch when it came to creating the legendary *Doom*. The much-lauded *Quake*, too, was the product of a completely new approach, each engine being tailored to the technology available at the time. "I like to think that we've been good at providing the appropriate hardware for the appropriate times and finding the 'sweet spots,'" he says.

In the case of *Doom*, Carmack's task was to create an engine capable of displaying indoor environments at unheard-of speeds. To achieve this, he limited the display possibilities of the engine, using only vertically or horizontally aligned objects (so that pitching and rolling viewpoints were impossible) and ensuring that the z coordinate on object faces remained constant, thus removing the need for time-consuming perspective correction. Compare the results with the 3D system on the PC version of *Magic Carpet*: Although highly rated at the time and powerful enough to support outdoor locations, Bullfrog's texture warping is unacceptable by today's standards.

3D Gaming
Classics

Zaxxon
Arcade
Compared to *Battlezone*, *Zaxxon*'s visuals were positively lurid, with a full-color, forced-isometric 3D landscape providing the backdrop to its *Scramble*-like gameplay. The ability to move up and down as well as left and right confused almost as many people as the sense of depth offered by the pseudo-3D. The isometric technique was greatly used later on the ZX Spectrum, notably with *Ant Attack*, *Knight Lore*, *Head Over Heels*, and *Highway Encounter*.

Wolfenstein (right) introduced speedy, texture-mapped environments to the world. *Quake* (left) brought in true 3D, rich background detail, and polygon-generated creatures, but it relied on tight, indoor locations to keep the frame rate adequate

3D Gaming
Classics

Wolfenstein
PC,SNES

Ultima Underworld may have arrived at the same time and boasted more ambitious 3D world rendering, but it was John Carmack's engine for *Wolfenstein* that really changed the face of modern computer gaming. Using an engine optimized for flat, indoor locations, the game gave rise to a format that has now become the dominant 3D genre on the PC. And yet it's still something that Id manages to do better than anyone else.

"I don't know if I was quite aware of how much things would change," admits Carmack. "But 3D was always the goal — to build a virtual world. Previously, the technology just wasn't there to make it fast enough."

A few select developers were given permission to license the *Doom* engine while other software developers were faced with the gargantuan task of bettering Carmack's code. *Doom*'s 3D may only have been workable for one particular game style, but it raised expectations for all 3D-based titles. Carmack himself went back to the drawing board, and the result was an engine that was advanced enough to power *Quake*. "There's not a line of code in *Quake* that's from anything that's gone before," claims Carmack. "We have all these other companies licensing from us, so all our technology gets reused. And we don't have to do that."

Carmack also credits the freedom to work on something until it is finished as one of the main reasons for his success. "With *Doom* I tried three revisions, and with *Quake* there were at least eight attempts. I'm not tied to the code I've written. I don't mind throwing it away and starting again. A lot of people couldn't do that. For me, a program is not going to be released until it's ready. Most companies just don't have that option."

The result is that *Quake* struts its stuff in a very different way from *Doom*. It's optimized for interior locations, using a technique to z-buffer on a scan-line basis rather than for the entire screen. With an ordinary z-buffer, a 3D engine would have to interpolate z coordinates for all the objects hidden behind walls, whereas with *Quake*, the system can determine how much of each polygon is visible for every scan. It's a testament to Carmack's work that the 3D card versions of *Quake* are not significantly faster than the standard software version.

"Some of the decisions it makes assume you're using large occluding polygons," says Carmack. "So there's never going to be an all-purpose engine. Our next generation stuff is designed to do both indoors and outdoors, but there are still going to be trade-offs. Although each generation becomes more flexible, there's never going to be a truly 'does everything for everyone' engine. And even if there was, it wouldn't be as efficient."

Optimal prime
So while the 3D cheats used by programmers in the '80s are rarely seen these days, optimization tricks have nevertheless become an important challenge for 3D programmers in the last few years. When trying to push a low-end PC or console to display panoramas in which hundreds of objects have to be displayed simultaneously, or shapes that are so complex that a couple of hundred polygons aren't enough, programmers have been forced to find shortcuts or alternative methods that limit the 3D rendering required.

For PC developers, there's the option of dropping perspective correction. Although this can produce the sort of warping seen in the aforementioned *Magic Carpet*, games that avoid placing polygons too close can take advantage of significant speed benefits. PlayStation has no perspective-correction abilities at all, so there's a constant battle to hide polygon warping. This is usually achieved by using a greater number of smaller textures, thus reducing the z-coordinate differences that result in warping.

Fogging, where an object's textures take on the hue of the horizon as they recede from the player's viewpoint, is another technique used to minimize the polygon count in outdoor scenes — the most recent example being Iguana's otherwise graphically impressive N64 game *Turok*. The benefit of simplified models to depict objects when they recede into the distance shouldn't be underestimated, nor should the use of lower-resolution textures. It does take some keen judgment to hide the transition to simpler models, however. Even recent flight simulations — Novalogic's *F22 Lightning*, for example — have utterly failed to hide the way that ground detail is reduced as altitude increases.

Several years before *F22*, Novalogic pretty much pioneered another method of generating outdoor landscapes quickly when it used voxel-based terrain to create the rocky landscapes in *Comanche*. Voxels are three-dimensional pixels that allow shapes to be scaled and placed "flat" on the screen — an approach that requires far less calculation than polygons. Infogrames has recently revived voxel landscapes for *No Respect*, and earlier this

year Jon Ritman at Cranberry Source used a voxel variant dubbed the "polar sprout," which enabled shoot-'em-up *QAD* to manipulate hundreds of 3D objects at once. "We won't be using the polar sprout techniques for the next games, though," says Ritman. "The speed gain is disappearing as powerful processors and 3D cards come in."

Ritman also points to the limitations inherent in the voxel system. "Voxels have their problems in their edging. When you get close to an object in *Doom*, the pixels are bigger but the edge is perfectly smooth, whereas with a voxel, they blow up in the middle and on the edge as well, so they don't look as sharp. There's also the problem that voxels tend to eat up data space."

The arrival of MMX was heralded as the solution to everybody's 3D problems, but it's now obvious that Intel's additions to the Pentium instruction set are difficult to come to grips with and are therefore not quite the panacea that was widely anticipated. "Sell your shares while you can!" exclaims Dave Perry at Shiny Entertainment. He does, however, look more favorably on the MMX2 standard used in the new Pentium II series, which reduces the number of wait states to switch between MMX and floating-point modes from around 50 clock cycles to just one. It's still not possible to pair MMX instructions with floating-point operations, though, because of the shared-register setup.

Consequently, few MMX-enhanced titles have appeared, and, *Unreal* aside, few look set to arrive. Ritman believes the industry's apparent lack of interest is due as much to lazy programming as anything else. "Used correctly, you can really make things shift, for both 3D maths and manipulation of pixels. It makes it possible to do things in parallel, if you're working in 16-bit maths, which strikes me as pretty good."

Ritman reckons that most code is switching over to floating point simply because it's faster on a standard Pentium, rather than for reasons of accuracy, and he therefore has no problems with the idea of using MMX-friendly, 16-bit, fixed-point (integers where several bits are used to denote fractions) maths instead. "A floating multiply can be done in one cycle, whereas a fixed point [on a standard Pentium] takes ten or more cycles," says Ritman. "With an MMX chip, you can do four fixed-point multiplies per cycle. Of course, you may have to think about how to deal with the limitations of 16-bit maths, but the gain is worth the work."

However, Carmack doesn't think MMX is particularly

appropriate for 3D rendering. "There are certain situations when it can be useful — we may use it in our next generation engine for building some surfaces, for instance. But it's not very good for a general 3D system — certainly not for any of the *Quake* stuff."

Accelerate to accumulate

But it's the invasion of the new breed of 3D accelerators that is really transforming the 3D scene. Practically every 3D title now offers 3D card support in one way or another, and the number of titles that won't even work without a 3D card will soon begin to rise. A few 3D acceleration solutions existed a couple of years ago, but without a standard or much in the way of developer momentum, they didn't survive for long. It was the arrival of Microsoft's Direct3D that provided the catalyst needed to start the card invasion, a whole sea of card standards now swamping the market, each boasting supposedly coin-op-quality performance and offering calculation-intensive extras like filtering, translucency, Gouraud shading, and mip-mapping. Their manufacturers boast that this is the sort of stuff to transform PC graphics beyond recognition and make programmers' lives far easier.

The reality, of course, has been very different. A whole batch of S3Virge-based accelerators offered fairly unimpressive acceleration, earlier versions of Matrox Millenium cards couldn't support 16-bit textures or fogging, and practically every combined 2D/3D accelerator card failed to make the grade in both areas. For most of 1997, there has been a clear leader in the performance field in the form of the 3Dfx Voodoo chip, used in the Diamond Monster 3D, the Orchid Righteous, Canopus Pure 3D, and even several coin-ops (such as *San Francisco Rush* and *Mace: The Dark Age* from Atari). Nvidia's Riva and Rendition's V2100 technologies have pushed 3Dfx with their recent releases, but native apps have been dominated by 3Dfx and to a lesser extent, PowerVR. PowerVR has done its best to achieve similar levels of user and developer support and has now gained the backing of several important publishers, including Psygnosis, Id, Sega, and Eidos. PowerVR did take considerably more time to release mature drivers needed to compete performance-wise in the areas of Direct3D and OpenGL support.

VideoLogic's Trevor Wing is keen to stress that it's not a war, however. "We feel that we have a chip as good as 3Dfx's every step of the way. But we're not fighting for a
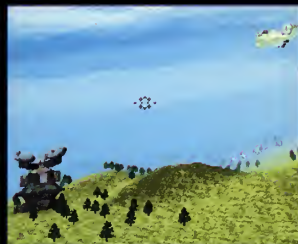
Voxel technology, first revealed in Novalogic's *Comanche 3* (left), was later revisited in Ocean's *No Respect* (center). *QAD* (right) from Cranberry Source demonstrates the company's "polar sprout" technology — a form of voxel-based sprite

The search for a standard

Despite numerous glitches, Microsoft's attempt to introduce a standard for 3D programmers and manufacturers initially seemed to have succeeded, at least until John Carmack and several others published an open letter to Microsoft complaining not only about the instability of the format but also about the way it handles and processes 3D data, pointing to the Softimage OpenGL standard as a superior 3D API.

"It inflicts great pain and suffering on the programmers using it, without returning any significant advantages," Carmack has argued before. "I don't think there is any market segment that D3D is appropriate for, whereas OpenGL seems to work just fine for everything from Quake to Softimage. There is no good technical reason for the existence of D3D. OpenGL is easy to use and fun to experiment with. D3D is not. You can make sample GL programs with a single page of code. I think D3D has managed to make the worst possible interface choice at every opportunity. Many things that are a single line of GL code require half a page of D3D code — to allocate a structure, set a size, fill something in, call a COM routine, then extract the result.

"All of the game-oriented PC 3D hardware basically came into existence in the last year. Because of the frantic nature of the PC world, we may be getting stuck with a first-guess API and driver model that isn't all that good. I'm sure D3D will suck less with each forthcoming version, but this is an opportunity to just bypass dragging the entire development community through the messy evolution of an ill-birthed API."

OpenGL uses a procedural interface, which means that it processes data as it receives it, while Direct3D uses an execute buffer. A whole set of vertex data and commands are passed over, then processed in one big lump. Carmack says, "On the surface, this appears to be an efficiency improvement for D3D because it gets rid of a lot of procedure call overhead. In reality, though, it is a gigantic pain in the ass." Having already abandoned a Direct3D-based implementation of Quake, id now hopes to avoid it altogether.

Aficionados of OpenGL also point to the program's other significant advantages, such as its more flexible color handling, more advanced culling (which eliminates triangles of a particular orientation — those facing away from the viewer, for example), and a stencil buffer for masking.

"Internally at Psygnosis, we have watched this argument closely and discussed it at length," says Dominic Mallinson. "We would agree that Direct3D has been difficult to use and that OpenGL is a more intuitive API. However, our use of these APIs is simply to draw the polygons. It's a relatively straightforward part of the total engine process and once the initial learning curve with D3D has been overcome, it does a very capable job. It seems that the core argument between D3D and OGL is over extensions. OGL allows hardware vendors to add new features, whereas D3D requires Microsoft to add these features. The OGL approach is more flexible and can allow for new features to be exploited in games more quickly. However, it is arguable that it leads to instability and incompatibility. Within Psygnosis, we are using both OGL and D3D, with the current emphasis being on D3D. We do not see this as a major issue."

"It's kind of interesting — you see points on both sides," says Chris Kramer at 3Dfx. "What Microsoft did was pretty clever, saying, 'There needs to be a standard, here's what it's going to be.' Now guys like Carmack are saying that you need GL support, that GL is better. I think Microsoft will be pretty receptive."

David Weeks at Microsoft concedes that OpenGL is a very good standard. "It's fully supported in Windows now. At the end of the day, I don't think there needs to be a winner. It's simply down to developer choice."

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share — it's a huge market, and there's room for all of us. We want them to succeed too. I think in the longer term there is a battle to be fought, but in the next year or two it'll be about getting good 3D on every PC. It's for the benefit of the end user. We're all working on creating the market." Chris Kramer at 3Dfx also feels that the 3D card market has a fair way to go. "To say that it's in its infancy would be an understatement, so there's a lot of room at this point."

The Voodoo² (see page 88 for an exclusive report) should up the ante even further when it's released in late Q1, and PowerVR will quickly follow suit with its next generation card (currently referred to as the PMX).

With gameplayers still adjusting to the idea of 3D accelerators, it looks as though the battle will go on for some time yet. Sources suggest that the polygon handling of VideoLogic's next card will be four or five times faster than its latest Apocalypse 3D, and while Chris Kramer at 3Dfx is unwilling to comment on the much-awaited Voodoo Banshee chip (not to be confused with Voodoo²), it is rumored to boast similar performance improvements. Few disagree that the power offered will be astonishing.

Access all areas

Even with Microsoft's DirectX format to link all the PC acceleration options together, the situation remains less than straightforward. Programmers currently have the option of providing 3D card support by either writing directly to the cards, which requires a substantial time investment in learning the standard, or by going through DirectX's Direct3D API. That so many developers have gone for the former route says much about Microsoft's "standard."

"I think DirectX is very poorly designed, and I suspect it's a result of not having a good games coder on their team," says Ritman. "There have been minor improvements, but it's still very slow. All the estimates suggest that if you use manufacturers' APIs instead, you get about a 20% increase. I don't think that's acceptable."

Carmack is equally scathing about Direct3D, having already published an open letter (together with several other developers) to Microsoft denouncing the format in favor of OpenGL (see "The Search for a standard"). "We believe that you'll get better applications for OpenGL than

Direct3D," he says. "The bottom line is that Microsoft wanted a proprietary API. It's gotten a lot better, but it's still not as good or stable as OpenGL."

David Weeks at Microsoft concedes that there have been stability problems but counters that the format has had to do its growing up in public. "Like any first run of a product, you have to listen, and we've hopefully taken that on board. If you look at a game, it takes 18 months to two years, and now that DirectX is reaching that point, it's getting to the stage where it's stable."

"Overall, D3D has done its job," says Dominic Mallinson, development guru at Psygnosis. "D3D has had its problems, many of which have been resolved — or are in the process of being resolved — and it is getting close to being a mature API. On the whole, proprietary APIs for doing card-specific versions have suffered from similar problems, and so using proprietary APIs has not been the easier approach, with the odd notable exception. Driver instability has been widespread and seems to be independent of API. Once again, this is improving."

"We're now seeing Direct3D-based titles like LucasArts' Jedi Knight and Rage Software's Incoming that are pretty incredible," adds Kramer. "Now that the initial grumbling is over, people are really figuring out how to push it."

The console solution

A 266MHz PC sporting a good 3D card may well put the current crop of consoles in the shade, but when PlayStation and Saturn were first aired, they showed the PC's limits. With sub-$400 price points, no system-compatibility problems, and built-in 3D support, these machines ushered in a new era of 3D far more accessible than the PC route.

Mallinson agrees. "I would have to say that PlayStation has been the single biggest 'event' ever in 3D gaming because it was the first to bring it to the masses and is such a good design that it is still holding its own against newer technologies."

PlayStation may lack the floating-point abilities necessary to avoid texture warping, but its translucency support and sheer speed have made it an ideal platform for 3D-enamored programmers. The Saturn benefits from cleaner, nonwarped 3D, but its programmers have rarely

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3D Gaming
Classics

Quake
PC

Just as Doom improved the Wolfenstein engine tenfold, Quake's 3D system changed the face of first-person shoot-'em-ups yet again. As a one-player experience Quake is undoubtedly disappointing, but few can fault the coding that makes the beautifully realized environment and polygon-based monsters possible. It's a testament to the power of John Carmack's engine that many gamers prefer playing the original Quake to the recently released accelerator-friendly versions.

squeezed comparable performance from the machine. Yet Harry Holmwood, MD at Pure Entertainment, recently told **Next Generation**, "As we've become more familiar with the way it works, we're now of the opinion that it is a better machine than the PlayStation."

However, Holmwood highlights the problem that while PlayStation has been designed for 3D graphics, Saturn is akin to a souped-up SNES and lacks the standard library routines necessary to get good results. Pure's forthcoming title *Lunatik* will only be able to offer lighting and transparency effects by addressing the DSP chip directly.

"I don't think there is a huge edge between any of the consoles in terms of their ability to create high-quality 3D games," says David Dienstbier, producer of the *Turok* games at Iguana. "All three consoles [Nintendo 64, PlayStation, and Saturn] have a number of impressive 3D games that are actually very comparable with one another as far as how much geometry they are throwing around on screen."

Even N64, with its huge array of 3D-specific effects, may not quite be the Silicon Graphics wonder machine its initial hype suggested, according to Dienstbier. "Anti-aliasing, z-buffering, bilinear and trilinear interpolation, mip-mapping, etc., are all 'free,' but none of these ensures that an N64 game will have an impressive 3D engine with a smooth, fast frame rate, or even high-quality graphics."

In graphical terms, however, the Nintendo machine is capable of competing with 3Dfx Voodoo, although admittedly at a lower resolution. With Sega's next machine tipped to use a PowerVR-based solution, its problems may be at least partially alleviated. The cost of RAM has also dropped sufficiently for Sony's and Sega's next generation of consoles to compete with PCs in terms of memory, if not CPU power.

There's also the argument that the console market is still pushing back 3D boundaries faster than the PC. Certainly, there's been nothing on the PC to compare with the complexity of *Wave Race 64* or the 3D gameplay of *Mario 64*. And with the advent of Psygnosis' *Rascal* and a handful of other titles, programmers are finally figuring out how to use PlayStation's high-resolution mode without compromising too heavily on textures or frame rate. It's arguable that consoles are still making the running.

Tricks of the trade

High-resolution console games are just the latest weapon in the 3D war, where despite the supposedly restrictive nature of console hardware and the arrival of PC accelerator cards, there is still a desire to create the latest and greatest 3D engine. The aforementioned *Rascal* not only generates convincing, almost warp-free scenes, but it also introduces tricks such as environment-mapping (giving the impression that an object is reflective) to PlayStation. Acclaim's Iguana team, meanwhile, has pulled off a high-resolution trick on N64, giving *NFL Quarterback Club '98* a clarity rarely seen beyond prerendered imagery. And then there's the current fad for over-the-top lighting effects, as exemplified by Psygnosis' spectacular *G.Police* and *Colony Wars* — the latter boasting an unprecedented amount of translucency, lens flaring, and shading.

Core's *Tomb Raider* is less immediately spectacular but is still impressive on all three formats (Saturn, PlayStation, and PC). Indeed, although the PC version has become the 3D card manufacturer's favorite, its engine is efficient enough to run at speed in SVGA, even on low-end Pentiums.

Quake remains the benchmark for many, though, with a wonderfully efficient 3D engine and a game design that, although familiar, makes full use of the opportunities a 3D world offers. It's this, just as much as the commercial considerations, that has led to so many rival developers embarking on *Quake*-style projects. Until *Mario 64* arrived, many argued that in terms of mainstream gaming (not counting flight simulators, in other words), Id's titles were the only ones to make 3D gameplay workable and intuitive. Ritman, for one, finds this situation worrisome: "It's strange that there are people out there designing games that they know won't be as good as what they are copying."

Ritman believes that only a few developers have grasped the art of 3D game design, and he's not even totally convinced by *Mario 64*. "There is no one I respect more than Shigeru Miyamoto, but in some ways I think he is better at 2D puzzles. I thought *Mario*, great though it was, relied far too much on the difficulties of the controls and getting the camera in the right position."

"Everyone's games are looking far more pretty, but they don't demonstrate any real forward thinking or fresh ideas,"

When Argonaut developed the Super FX chip, it gave Nintendo's SNES the power to handle 3D geometry and was used to great effect in *Star Fox* (left). The N64 version of the game (right) demonstrates the great strides made in 3D in the past four years

3D visuals **explained**

While there's no single way in which to display realtime 3D, the most popular method at the moment involves the use of texture-mapped polygonal 3D to display hierarchically defined models composed of several polygons that share vertices. These polygons are the triangles and rectangles that join to depict the body of a racing car in Core's *Formula One*, a landscape in *Jetfighter III*, or a fighter's weapon in Namco's *Soul Blade* on PlayStation.
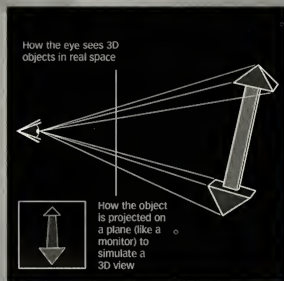
The coordinates of each vertex on a single model are defined in "model space" — its own 3D area with an origin relative to the model itself. Each model then also has a position in the engine's "world space," as well as an orientation in three degrees (x, y, and z). The position is stored in matrix form while its orientation is a vector, with the two combining to give an affine.

The first step in depicting the model on screen is to use this affine to transform the model space vertices into world space ones. The object now exists in the actual game world. To actually draw the model, a further transformation is required because the camera origin has its own position and orientation in the world space. The inverse of the camera's affine in world space is what's used to transform each model's world space vertices, creating a third set of values representing the object's position relative to the viewer.

This isn't the final step, however, for all the objects then need to be projected onto the screen, which is best thought of as a flat plane between the viewer and all the objects. This is achieved by simply taking a line from each polygon vertex to the viewer. The point at which that line crosses the flat screen plane is where the pixel is drawn for that vertex. Each point on the polygon also has a coordinate that relates to its texture. Raycasting and/or interpolation is then used to obtain the texture information to fill the polygon. Raycasting involves dividing the triangle into horizontal (or vertical) scan lines, then drawing (or casting) a line from the origin through the pixel on the screen plane and onto the polygon in 3D camera space to obtain the texture coordinates. Such a process is time-consuming, however, so 3D systems usually only do as many raycasts per polygon as necessary and interpolate the rest of the data. On PlayStation this raycasting isn't even possible, so all texture data has to be interpolated, producing results that are really only accurate when there's no difference in z values between the coordinates.

This method makes it possible to render 3D models on screen, but there's still the task of sorting them in the right order. It is possible to use the "painter's algorithm" (as used on PlayStation), which

simply involves painting the distant objects onto the screen first, but this results in inaccuracies where polygons overlap. Something called a spatial partitioning tree can be used to sort the polygons within a model, making these glitches less likely, but the most effective way is using a full buffer, most commonly a z-buffer. Because the sort is carried out using the inverse of the z coordinates, it provides greater precision for closer objects.

How the eye sees 3D objects in real space

How the object is projected on a plane (like a monitor) to simulate a 3D view

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argues Dienstbier at Iguana. "The same problems exist that have always existed, and some new ones have become apparent."

It's certainly possible to argue that advances in 3D hardware have made it easy to hide poor-quality design behind impressive visuals. Shiny's Perry: "Bad games are bad games, bad programmers are bad programmers. And believe me, programming 3D cards is not a walk in the park — a lot of 2D programmers are history."

Equally, it's hard to fault technology that makes 3D a less time-consuming process. "There is no doubt that the 3D cards are freeing up more time for the programmers to improve other factors of the game," says Psygnosis' Mallinson. "Gameplay is all about design, and implementation of design is a compromise based around the technology and performance available and the time it takes for the programmer to implement it. Three-D hardware definitely allows for more performance and more time for the programmers, but it still comes down to good design at the end of the day."

The future's bright, and expressed as a function

The events set to shape the future of 3D graphics will no doubt be the next generation of 3D cards (the Voodoo Banshee and VideoLogic's Highlander) and the introduction of Intel's AGP standard (see page 94 for more on AGP).

And just as rival developers are catching up with the level of technology demonstrated in the original *Quake*, so Carmack is set to push the standard forward yet again. This comes as a surprise to many, who expected *Quake 2* to be nothing more than a new array of levels and monsters. Instead, the 3D system has been substantially upgraded.

"It was never planned that way, but I've been devoting most of my time to *Quake 2*," says Carmack. "It includes most of the obvious things, such as interpolated frames on the model animation, as well as more detail. We've got environment-mapping with the sky now, and the OpenGL version includes full three-channel lighting."

Elsewhere, Shiny's *Messiah* (**NG 33**) has been embraced by many as the next step forward. "It's about two

years ahead of any other game development company's engine," claims Perry. "We've shown realtime tessellation, with models of 120,000 to 180,00 polygons scaling in real time. Someone's face can fill the screen in perfect detail, then go down to one pixel, super-smooth. It has realtime deformation — our characters have real skin and muscles that actually deform and stretch. It's truly eerie to look at. We also have cloth stretching, which I've yet to hear about, never mind see, in any other game. We don't sacrifice feel for graphics; we make the graphics work themselves to keep the feel and response."

Perry also reckons that *Messiah* will run faster in software than with most 3D accelerators, but he also believes that "the new cards that are coming out complement our technology, and I think you will see *Messiah* being used as the yardstick by many of them."

The tessellation techniques used by Perry seem to solve many of the problems currently limiting 3D model detail. "Basically, what we do now is let the software add extra polygon detail by equation," he explains. "This also stops the rotten old hardware stretching pixels that would look bad when close, and allows the game to control its own speed of execution. It also removes glitches and is a perfect solution for consoles. It will have to happen in all games in the future, but it's just a bitch to get working properly."

Using maths-based functions rather than slow, memory-hungry data is definitely beginning to make an impact. Developer Innerloop, for example, is using its Iterated Functions Systems technology to generate landscapes that would otherwise require thousands of polygons, with the data stored as parameters and textures in mathematical form rather than 3D polygon models. "Dynamically generated geometry is definitely the next step," agrees Carmack. "The next thing I'm working on are images generated using curves and fractals."

With 3D model data represented as mathematical expressions, data can be tessellated in real time, making the 3D engine faster and more memory efficient. The lack of standard, fixed-model data also has implications for animation. "In *Quake* we used vertex interpolation, but

Valve Software's *Half Life* uses skeletal modeling with the *Quake* engine," says Carmack. "It's definitely where the future is going. In the long term we'll be doing continuous skin and deforming the mesh rather than moving objects for animation."

Carmack believes advances in 3D will have another side effect, putting a greater distance between the real innovators and the also-rans. "It's taking much longer to develop each generation. *Wolfenstein*'s engine only took eight months while *Quake*'s took 18. Even though there are a huge number of people, particularly in the demo scene, who can do something really impressive, the gap between demo and game is widening. The people who are the real competition are those who have great talent and great discipline."

Three is the magic number

As Id's designers put the finishing touches to *Quake 2*, Carmack is already hard at work on the Trinity engine that will embrace these new techniques. "We'll do another *Quake 2* pack, and then start to make use of the next technology. The first game to use it will be fairly simple, then we'll follow that with something more substantial. More than ever, our strategy is to get something out that's leading edge, then do something better."

Another alternative method for creating highly detailed 3D models can be seen in Westwood's *Blade Runner*. By using smaller, flat-colored polygons rather than implying detail with textures, the developers are able to manipulate shapes of more than 35,000 to 40,000 flat-colored polygons in real time. The use of nontextured, nonshaded faces may seem like a retrograde step, but with each polygon rarely scaling more than a few pixels, the extra detail is arguably redundant. And no doubt it won't be long before textures are added using this method anyway.

It's a broadly similar solution to that proposed by MetaTools' "trixel" Real Time Geometry system, which stores 3D models as points in space rather than predrawn grids, with the picture data embedded in the point descriptions rather than existing as a separate texture map. Which points need to be displayed, and how they connect, are calculated in real time using algorithms based on Delauney triangulation, again making it possible to dynamically alter the complexity of a model in real time, with the algorithms placing more triangles in areas where smoother color changes are necessary. MetaTools

MetaTools' Real Time Geometry system offers a uniquely efficient method of 3D model manipulation

claims that the RTG method is much faster than dealing with standard textured models on non-3D-accelerated machines, with handling speeds almost as fast as those associated with 2D graphics.

All these techniques mean faster, more complex 3D, which in turn is likely to give other effects a boost. "I think atmospherics like realistic fog, light dispersion, and specular highlights are going to be big," says Carmack. "There's a huge list of features still available that exist in 3D rendering packages but not in game 3D. I know certain people are saying that there's no more room for technology, but there's so much further that we have to go."

"I think the problem is that we're on two opposing forces — the first is we want to increase frame rate and the other is to increase image quality," says Wing at VideoLogic. "The challenge is to do both at once. Adding things like bump-mapping and isotropic filtering puts a huge hit on performance. You need massive fill rates to do that and keep performance up. The next stage is going to sort out the men from the boys."

And all the while Microsoft will need to keep its DirectX format abreast of the changes if it's to remain a standard. A recent conversation **Next Generation** had with Kevin Bachus at Microsoft indicates that it intends to, with support for multiple per-pixel textures and other technologies planned for DirectX 6.

"If you look at the hardware five years from now, it'll be doing 10 million polygons per second," says Carmack. "The obvious thing is that we'll eventually be able to do *Toy Story*. And equally, we'll be able to do better games as that technology becomes available."

Next Generation only hopes that such advances in 3D really are complemented by comparable leaps
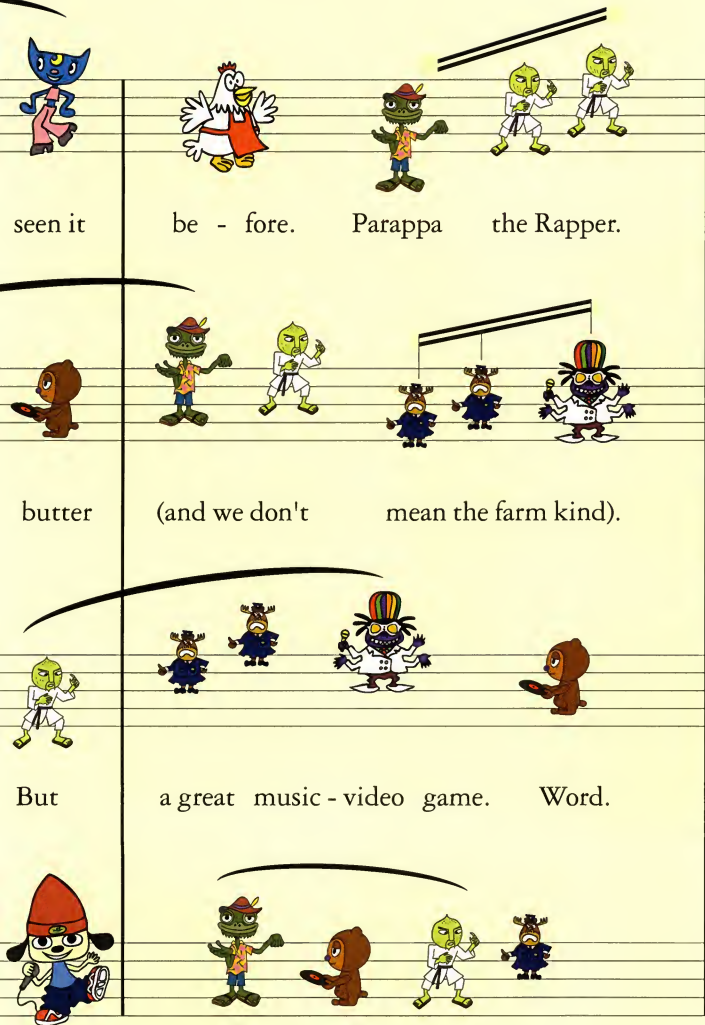
ng

G.Police (left) and *Colony Wars* (center) from Psygnosis are part of a new breed of PlayStation titles, pushing the translucency capabilities of the machine to the limit. *Neon's Tunnel B1* (right) was one of the first 3D PC titles to produce similar effects in software with no hardware acceleration

seen it   be - fore.   Parappa   the Rapper.

butter   (and we don't   mean the farm kind).

But   a great   music - video   game.   Word.

Only on PlayStation.

3Dfx Voodoo²

The first of the next generation of 3D game accelerators is unveiled. It promises Model 3 power for under $300. Is 3Dfx creating a new platform?

U nlike the console market, where manufacturers will try to extend the life of a given platform for as long as possible (see Talking this issue for a glimpse at Sony's strategy), the motto in the fiercely competitive 3D acceleration market has always been, "more, faster." So it's no surprise that 3Dfx is unveiling its next generation chipset Voodoo² before cards based on its first effort Voodoo have even reached their terminal price (around $99).

The story so far

While firms like S3 and ATI racked up millions of sales in the past two years selling cheap acceleration chips directly to motherboard manufacturers, 3Dfx concentrated on power, figuring that if its engineers built the best hardware, someone would buy it for some use, like for arcade machines or high-end simulators. Then the price of RAM dropped through the floor and suddenly the Voodoo technology was an affordable $299 consumer add-in board.

By focusing its API development and marketing efforts solely on games, and by licensing its chipsets to a number of board manufacturers, 3Dfx managed to quickly gain mind share among developers (who were generally impressed and intrigued by the chipset's and API's feature set) and market share among consumers.

3Dfx certainly isn't alone in the marketplace, but its closest competitor, NEC's PowerVR, is not quite as powerful in real-world applications. But more significantly, its API, SGLDirect, requires programming for planes

Voodoo² reference board
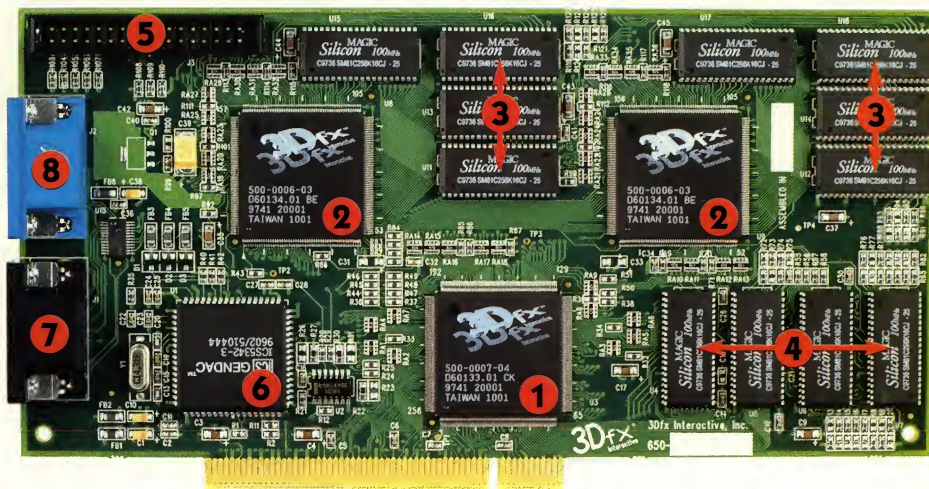
1) Frame buffer unit, code name "Chuck"

2) Texture map unit, code name "Bruce"

3) Dual 2MB RAM banks for texture map units

4) 2MB RAM for frame buffer

5) Jumper to connect boards for scan-line interleaving

6) Digital to analog converter

7) Video-in from PC videocard

8) Video-out to monitor
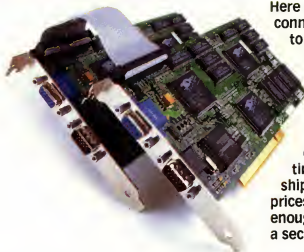
Here are two reference boards connected with a ribbon cable to enable scan-line interleaving. The cable will be included with every unit sold — 3Dfx is serious about marketing scan-line interleaving as a consumer upgrade. By the time games that require SLI ship, 3Dfx expects that board prices will have come down enough to make the purchase of a second board a no-brainer.

instead of the standard 3D method (used in Voodoo's API, Glide), which uses vertices. Glide-specific ports are relatively easy; SGLDirect ports require more effort. As demonstrated by the early days of PlayStation and Saturn, given a choice, developers will generally go with the easier development target.

When Voodoo-based boards were first released 16 months ago, they took the rest of the industry by storm. No one could do what 3Dfx could do, and that's a lead the company aims to keep. A year later, only Nvidia's new Riva and Rendition's 2000 series can match the power of Voodoo. "As [our competitors] get close to Voodoo with their new products, we're going to pound them down again," says Scott Sellers, VP of R&D. Strong words, but the facts seem to bear him out.

Simply put, Voodoo^2 should be the most powerful 3D acceleration hardware for personal computers to date. You can do better, but not with anything that can be put in a Windows 95 PC. The cost? Boards are expected to start around $299 and eventually come down to around $199.

The raw speed of Voodoo^2 is impressive — we saw *Quake* running on Voodoo^2 at more than 120 frames a second (too fast to play, and too fast even for the monitor's refresh rate). But what's more impressive is what developers can actually do with that speed. Voodoo^2 is to push one million "real," fully featured, in-game triangles per second, a factor of 10 greater than Nintendo 64, five to eight times greater than PlayStation, and more than three times better than the current Voodoo chipset. That's better, in fact, than the Model 3 board that drives *Virtua Fighter 3*. (It's also important to note here that a fully featured Voodoo^2 triangle is doing a lot more — like hardware z-buffering, backface culling, etc. — than a fully featured PlayStation triangle.)

The frame rate goal? A consistent 60fps at 640x480 resolution. "We don't think real interactivity starts until you get to 60 frames per second," says Sellers. "A lot of consumers think 30fps is enough, but the difference between 30 and 60fps is amazing. Arcade developers won't touch anything that can't do 60fps."

Voodoo^2 features

In some ways, the Voodoo^2 is very familiar. Like the company's original Voodoo, it is a multichip, 3D-only solution. It has a superset of Voodoo's features and uses a superset of the Glide API, meaning that it is fully compatible with all software written for the original Voodoo implementation. Better than just being

A Voodoo^2 card poses suggestively with the Voodoo^1-powered *San Francisco Rush*. Atari Games' next efforts will feature the next generation of 3Dfx technology and should look hot

backwards compatible, old software will actually run faster and smoother on Voodoo^2.

The differences, however, are impressive. Voodoo^2 is an evolutionary step beyond Voodoo, but it is a great one. First, the raw performance of the chipset is significantly higher, and many new features have been included. Second, the use of dual texture processors gives a significant performance boost. And finally, the ability to link two identical boards together to enable scan-line interleaving means that performance in some areas can be easily doubled.

One of the most significant improvements with Voodoo^2 is that all triangle setup is now done in hardware. "We did about two-thirds of the setup in hardware before, but this means there will be a significant boost," says Sellers. A number of features that were previously implemented in software at the driver level like zero-area triangle culling (getting rid of triangles smaller than one pixel in size) are now done in hardware as well. "Basically, all the CPU has to do is send down some data, and we do the rest," says Sellers.

Another new feature is improved fog performance, thanks to a 64-bit hardware fog table. Previously, the amount of fog always had to either stay steady or increase as objects

moved further into a scene. With Voodoo^2, however, developers can create zones of denser fog in front of weaker fog. Effort has been made as well to reduce the "fog banding" that results in objects "popping" from one fog level to another. All fog effects are calculated on a per-pixel basis.

The company claims that its floating-point z-buffer enables more depth levels than the industry standard 16-bit integer z-table, which should eliminate z-aliasing on objects deep in a scene. The triple color buffer (which enables

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The following vendors were slated at press time to be offering boards featuring the Voodoo^2 chipset:

Diamond
http://www.diamondmm.com

Creative Labs
http://www.creaf.com/

Canopus
http://www.canopuscorp.com/

Jazz
http://www.jazzmm.com

Orchid
http://www.orchid.com

rasterization to happen in a third buffer during v-sync) can now be used concurrently with the z-buffer, something that wasn't possible with the Voodoo chipset.

The maximum resolution for Voodoo² will be 1024x768, and support for TV out (NTSC and PAL) is planned for some boards. The first boards (due in early 1998) will be PCI-based, but the chipset is AGP-compatible. Expect to see AGP-based boards as soon as AGP motherboards gain significant market penetration (and maybe before then, thanks to bundling deals with PC makers). We expect this to happen in late 1998.

By far the most important new feature is support for scan-line interleaving (SLI). Each card will have a jumper on it, and by attaching two cards in adjacent PCI slots with a ribbon cable, users can transparently upgrade their performance. When connected, one board handles the odd monitor scan lines, and one handles the even scan lines. This effectively doubles the frame buffer memory, the texture memory, and the fill rate (as well as things like the triple color buffer, etc.). SLI is transparent to

the application, and supported in both Glide and D3D. Although no single-card SLI solutions are planned for launch, Sellers expects high-end board makers like 3Dfx subsidiary Quantum 3D to offer them by mid- to late-1998; by that time AGP boards will be ready, and since there is only one AGP per motherboard, a single card solution will be necessary for scan-line interleaving.

Voodoo² performance

The first configuration of Voodoo² to ship will be the "2220," which will have a 2MB frame buffer and 2MB for each texture processor. The architecture actually supports up to three texture processors, hence the zero. Sellers admits that some arcade boards will use three texture units for maximum performance but doubts they'll be in consumer level boards.

3Dfx claims that with all features turned on, the board will be able to fill 90 million z-buffered, alpha-blended, texture-mapped, fogged, per pixel mip-mapped, shaded pixels per second (180Mpixels with SLI). Triangle performance under the same circumstances (assuming 25-pixel triangles) is greater than two

million triangles per second. The company says that will translate into better than one million triangles per second in real-world usage.

More significant than the benchmark numbers, though, is the architecture itself. By providing two texture units, the board enables routines that used to take two passes to be done in one. An example of where this will result in significant improvement can be found in the Quake lighting model.

Everything in Quake is drawn twice, first as a flat, unlit surface, and then as a lighting/shadow map. The two textures are combined to create a seamless, smooth, onscreen representation. It looks great, but every triangle needs to be drawn twice. Not anymore. By having one texel unit handle the base textures and another one the light textures, the scene can now be created in a single pass, for a massive speed gain. Trilinear filtering can also be done in a single pass (by using the two texture units to hold different mip-maps). Other expected uses for the dual texture units, according to 3Dfx, are projected texture maps (spotlights, etc.), detailed texture-

Voodoo² launch titles

The following titles will support Voodoo² natively when it is released (Note: These shots are not necessarily Voodoo²-optimized)

Daikatana
developer: Ion Storm
publisher: Eidos Interactive

Die by the Sword
developer: Treyarch
publisher: Interplay

EarthSiege 3
developer: Dynamix
publisher: Sierra On-Line

F1 Racing
developer: Ubi Soft
publisher: Ubi Soft

Half Life
developer: Valve
publisher: Sierra On-Line

Hexen 2
developer: Raven
publisher: Activision

Jet Fighter 3
developer: Mission Studios
publisher: Interplay

Longbow 2
developer: Origin
publisher: Electronic Arts

Messiah
developer: Shiny
publisher: Interplay

The Voodoo² chipset — the full specs

Performance
•Base chipset: 80 million bilinear-filtered, mip-mapped pixels/second fill rate
•2 texture units: 160 million effective simultaneous two-texture, bilinear filtered, mip-mapped pixels/second fill rate
•Scan-line interleaved: 320 million effective simultaneous two-texture bilinear filtered pixels/second fill rate
•2 million triangles per second with real game triangles

3D rendering
•Triangle-based raster engine with Gouraud modulation
•16-bit integer and floating-point z-buffering with biasing
•Full hardware setup of triangle parameters
•Automatic hardware back-face culling
•Support for multitriangle strips and fans
•Transparency and chroma-key with dedicated color mask
•Alpha blending on source and destination pixels

•Sub-pixel and sub-texel correction to 0.4x0.4 resolution
•24-bit color dithering to native 16-bit RBG buffer using a 4x4 or 2x2 ordered dither matrix
•Per-pixel and per-vertex atmospheric fog and haze effects simultaneous with alpha blending
•Polygon edge anti-aliasing

3D texture-mapping
•Perspective correct (true divide per pixel) 3D texture-mapping
•True per-pixel, level-of-detail mip-mapping with biasing and clamping
•Full speed bilinear and trilinear filtering
•RGB modulation/addition/blending combines textures and shaded pixels
•Texture compositing for multitexture special effects
•Support for 14 texture map formats
•8-bit paletted textures with full-speed bilinear filtering
•Texture compression through narrow-channel YAB format

Host interface
•Zero-glue PCI v2.1 bus interface runs at 33 and 66MHz
•PCI input FIFO optimized for high-speed bursting of geometry and texture data
•AGP-compatible
•Memory-mapped addressing with linearly mapped frame buffer and bi-endian byte-ordering support
•Programmable and event driven interrupts

Memory system
•Advanced architecture with up to 3.6GB/second memory bandwidth
•2-4MB of EDO DRAM frame buffer memory
•2-4MB of EDO DRAM texture memory per texture unit
•Up to 12MB total texture memory

Display system
•Supports resolutions up to 1024x768 with double and triple buffering
•Constant frame rate buffer-swap management
•16-bit and 24-bit gamma correction on video back end
•Support for industry standard RAMDACs
•Compatible with any 2D graphics controllers through video pass through connector

Software support
•Optimized drivers for Microsoft's DirectDraw and Direct3D and 3dfx's low-level Glide interface

Technology
•Custom ICs fabricated in 0.35 micron, 3-layer metal CMOS
•Pixelfx2 is a 256-pin PQFP; Texelfx2 is a 208-pin PQFP
•3.3V operating voltage with PCI and 5V tolerant IOs

MS Flight Simulator '98
developer: Microsoft
publisher: Microsoft

Need for Speed 2 SE
developer: EA Seattle
publisher: Electronic Arts

NHL Hockey '98
developer: EA Canada
publisher: Electronic Arts

Prey
developer: 3D Realms
publisher: GT Interactive

Quake 2
developer: Id Software
publisher: Activision

Riot: Mobile Armor
developer: Monolith
publisher: Microsoft

SiN
developer: Ritual Entertainment
publisher: Activision

Special Ops
developer: Zombie
publisher: BMG Interactive

Tanurus
developer: Sony Inter. Studios America
publisher: Sony Inter. Studios America

Ulitm@te Race Pro
developer: Kalisto
publisher: MicroProse

Unreal
developer: Epic Megagames
publisher: GT Interactive

Wing Commander Prophecy
developer: Origin
publisher: Electronic Arts

mapping (imagine approaching a wall in *Prey* and seeing not a blurry mess of pixels, but highly detailed bricks ...), environment-mapping on translucent surfaces, and more.

The use of multiple textures is just starting to pick up, so the dual texture units seem to come at a perfect time for developers. Support for dual textures is already in the latest Glide API and should be part of DirectX 6 when it is released (sometime in 1998, according to Microsoft). If developers don't want or need to take advantage of the two units discreetly, they can use them as a single, virtual, large, 4MB texture effects unit.

The future of 3D-accelerated gaming

The real story about the chipset, though, isn't its raw speed — even if your monitor refreshed at 120 frames per second, your eyes can't — it's what it enables developers to do with the board's special features. "We want people to be able to tell their artists to go wild and do anything," explains Sellers.

Until now, most 3D-accelerated games have looked a lot like smoother, faster, unaccelerated games. Some have even derided the "accelerated look" of some titles — smooth and crisp, but blurry and sometimes soulless. The widespread acceptance of 3D accelerators in general, and Voodoo[2] in particular, offers the possibility for a change. By focusing on new higher-spec cards like Voodoo[2], developers can focus on making 3D-accelerated games look better than just smoother versions of 3D games designed to run in software. That means more polygons, more (larger) textures maps, and ultimately more detailed, complex, and realistic environments and games. One thing Voodoo[2] can't do is ensure good games — it might even make them worse.

Although gameplay is always paramount, there has been, in past 3D games, some correlation between good graphics and good
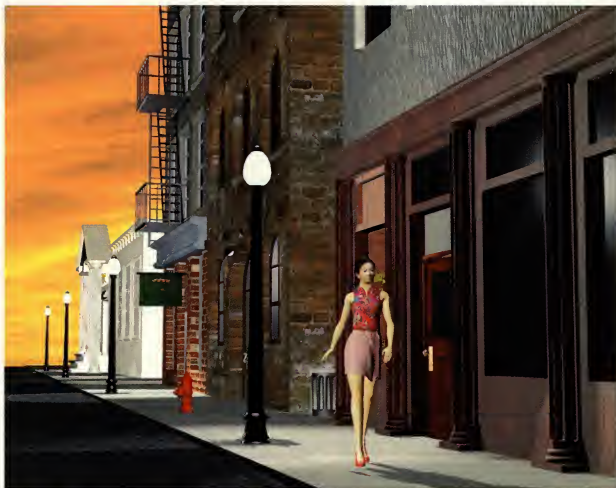
A scene this complex — the buildings are mostly polygons, not texture-mapped boxes, and the figure is a 5,000-polygon model — running in real time at 60fps? That's the promise of Voodoo[2]

gameplay. The better programmers — those who could create better 3D models and engines — generally were on the teams that made better games (think of *Quake* or *Doom* versus their sub-standard clones). With powerful hardware like Voodoo[2], almost anyone will be able to make something that doesn't look terrible. Expect game companies to promote their 3Dfx connection as strongly as possible ("*SuckJob* is 3Dfx-enhanced, just like *Quake 2!*").

Also, as soon as developers get used to the hardware, expect a rash of titles that look fantastic. Not titles that play fantastically, just ones that look fantastic. Just as many of the early PlayStation titles were criticized for being all flash and no substance, many of the titles that take advantage of the 2220 setup

(at least initially) might very well be more glitz than guts. That said, the initial Voodoo[2]-enabled game release list reads like a "who's who" of proven game development talent, so there will certainly be excellent games released that take advantage of Voodoo[2] as well — just remember that the 3Dfx logo is not a seal of software quality.

3Dfx makes no secret of its long-term corporate goal — it wants to make 3Dfx-enhanced systems a distinct platform, as separate from a standard PC as PlayStation is from Saturn. To do that, it needs to get developers to take advantage of its cards, not through Microsoft's Direct3D, but through Glide.

Although 3Dfx's installed base may never be as wide as that of its less expensive competitors, by going after hard-core gamers — the roughly 20% of the market that accounts for roughly 80% of the sales — the company has managed to get developers extremely interested in its technology. Voodoo[2] will certainly keep that interest, as will news that upgrade powerhouse Creative Labs will be releasing a Voodoo[2] upgrade card. The race for the ultimate 3D standard for PCs is far from over, but 3Dfx, which leapt to the front after the first generation of accelerators really improved the look of games, appears to be strongly poised to keep that lead into the second generation as well.

Supporting shading and texturing effects is important, but the real power of Voodoo[2] lies in its ability to enable developers to push more polygons and create more detailed 3D worlds

Accelerated
Graphics Port

If you need more proof that 1998 is going to be "the year of the PC" in gaming, look no further


The AGP version of Psygnosis' *G.Police* uses four times the amount of texture data as even the 3Dfx version

The last two years have seen Microsoft make DirectX, an API package with few applications other than games and an integral component of Windows 95. This was followed closely by major PC manufacturers, including Compaq and Micron, beginning lines of computers dedicated to little else besides playing games. Now, get ready for the next step: Hardware giant Intel has introduced the Pentium II/AGP architecture, and PC games will never be the same again.

To begin with, the Pentium II CPU is much more than just a faster Pentium. Building from elements of its Pentium MMX and Pentium Pro CPUs,

Intel has fashioned the Pentium II into a serious computational monster. Of course it features the MMX instruction set for fast multimedia performance, but the processor's real advantage lies in its Dual Independent Bus (DIB) architecture, first used in the Pentium Pro. Unlike previous CPUs, which used a single bus to shuffle data to and from both the processor L2 cache and the main system memory, DIB uses one for each. The L2 cache bus scales its speed to the speed of the
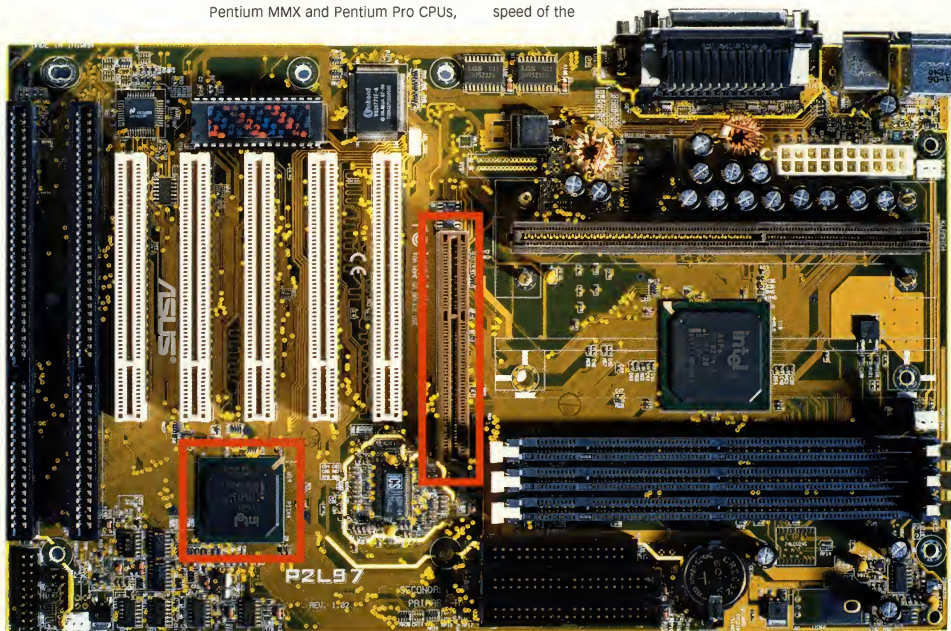
Intel's current AGP-based motherboard design boasts the 440LX chipset (framed, left). The AGP slot itself is framed just to the right of the chipset

CPU, up to a maximum rate of 150MHz when used with a 300MHz PII. Incidentally, that's more than twice as fast as the original Pentium, which was locked at a rate of 66MHz. Further, the CPU main memory bus allows simultaneous parallel data transfer as opposed to the sequential transfer of the previous CPUs.

All this makes for a very fast CPU indeed, but what will make the most difference to gamers is the way the CPU is integrated with Intel's new Accelerated Graphics Port (AGP) and the 440LX AGPset chipset that supports it. Intel's last expansion port upgrade, the good old PCI bus, runs at 33MHz and works just fine for 2D Windows acceleration and a large number of other peripheral needs. However, the day of 3D has long since arrived, and the data requirements for 3D environments, especially large-scale texture maps, have made working with PCI a real nightmare. The current AGP standard doubles the bus speed to 66MHz and also speeds transfer by opening a pipeline directly to system memory.

Although the main data AGP path is 32 bits wide, AGP includes an 8-bit "sideband" so that the graphics card can send data requests to system memory while simultaneously receiving data. Sidebanding, however, is not quite optimized yet in the current 440LX

A box diagram of the Intel AGP/Pentium II architecture shows the setup. Note how the L2 processor cache is now integrated into the CPU itself, with its own data path. Also note how the AGP bus is routed directly to system memory

AGPset. There exists at the moment two "levels" of AGP: 1x and 2x. AGP 1x doesn't support sidebanding, relying on back and forth DMA between the graphics card and memory. This is still faster than PCI, but real acceleration begins with AGP 2x, which transfers two 32-bit data blocks per each cycle of the 66MHz bus and supports sidebanding. However, 66MHz is a bit slow for this kind of transfer, and as of this writing, only one card, the Xpert@Play from ATI, utilizes it.

But to realize the true promise of AGP acceleration, gamers will have to wait until sometime later this year and the introduction of the 100MHz 440BX AGPset (which will, incidentally, require 100MHz SDRAM for system memory, but that's another story). Also sometime later this year, expect the AGP 4x standard, which transfers four 32-bit data blocks per cycle. AGP 4x cards will probably reach the market by 1999.

The key to making all this work, however, is not so much in the individual parts of the architecture, but in the integrated whole. The wide data pipeline between the AGP slot and the

AGP enhancements make two titles from Ubi Soft, *Redline Racing* (top and bottom) and *Tonic Trouble* (center) a feast for the eyes

The smooth, fast AGP graphics mean games will look better than ever — how they play is another question

system memory, the ability of the CPU to access system memory and its own L2 cache simultaneously, and the flow of information back and forth between memory and an AGP 3D graphics card all combine to offer screaming 3D performance. For example, since the bottleneck between a 3D accelerator and system memory has been virtually eliminated, system RAM can be used to store textures. This will result in

game designers using a larger variety of textures, as well as higher-resolution textures. The AGP version of Psygnosis' *G.Police* uses almost four times the amount of texture data as the Direct3D version, including animated textures for the city's video billboards — the environment comes alive on a level that has to be seen to be believed.

The advent over the last two years of less expensive, powerful 3D accelerators in the PC market has shown the world exactly what kind of a gaming powerhouse the PC can be. With Intel's latest architecture advances — implementing features that can have no other purpose than gaming (and don't try to fool yourself into thinking otherwise. It doesn't take a 100MHz data bus to run Quicken) — the PC is quickly becoming the choice for the serious gamer in all of us.

Girl
trouble

Things have changed since Lara Croft made her debut — now these "dream girls" are popping up all over the place. But is it just a cheap way to sell games? **Next Generation** investigates

he videogame industry has always had a difficult relationship with women. In the early days, they were banished from the gaming universe altogether or only included as trophies — objects of desire for the determinedly masculine hero to rescue at the end of a level. Sadly, even when cast as lead characters, they rarely fared any better. *Gauntlet*'s Valkyrie, for example, represented the standard *D&D* fantasy (short skirt, heaving chest, flowing blond hair) while Samus Aran, the heroine of *Super Metroid*, would strip to her underwear if players finished the game within two hours. Which, as far as Next Generation can recall, never happened to Mario.

So have things gotten any better over the last few years? The simple answer is: not much. Admittedly, there are now more high-profile female characters in videogames than ever before, but they all seem to be constructed around very simple aesthetic stereotypes. In the East, it's all giggling schoolgirls and sailor uniforms (see boxout), but in the West the recipe appears to be bee-sting lips, a micro-thin waist, and voluminous, pneumatic breasts.

Lara Croft is the obvious example. Since *Tomb Raider*'s debut in November '96, the fearless adventurer has graced countless videogame magazine covers, sporting her instantly recognizable uniform of skin-tight vest and combat hot pants. She's even appeared in a fashion shoot for U.K. lifestyle mag *The Face* and has had a real-life presence in the form of 22-year-old actress Rhona Mitra. Next Generation hasn't been immune to Lara mania either — our September 1996 cover marked her first appearance in the U.S., and Mitra was featured prominently in last month's interview with Core's Jeremy Smith.

Elsewhere, Lara wannabes are not hard to find. Eidos' own *Deathtrap Dungeon* features Red Lotus, for example, whose leather one-piece must cause some serious chafing, and then there's *Dark Earth*'s Delia, whose medieval bikini (two small metal discs acting merely as nipple covers) defies most physical laws. Finally, Nadia from *Nightmare Creatures* hunts monsters in a low-cut, frilly red top. All these things conveniently highlight another defining characteristic of the videogame female: wholly inappropriate clothing. As Kim Blake, a producer at Gremlin, states, "A perfect example is a cut scene in *Terminator: Future Shock*,

The Eastern approach

While Japanese game designers put scantily clad lasses in their games too (Capcom's *Final Fight* (top) being an early example), they also reveal an obsession with schoolgirls. This phenomenon has reached epidemic proportions in the world of anime and has become a beat-'em-up institution. The females in *Street Fighter EX Plus Alpha* (bottom), *Toshinden 3*, and *Fighting Vipers* look barely a day over 15.

However, the obsession with female youth reached its nadir in *Tekken 3*. The game is set 19 years after *Tekken 2* and all the male characters have aged accordingly. But what of Nina and Anna? The story behind the game explains that they were used in a cryogenic sleep experiment, to emerge 15 years later without aging. How very convenient.

which shows a group of military personnel discussing strategy. All the men wear black tunics and trousers, but the woman in the scene wears a black bra top!" Realism, it seems, doesn't get a look in.

Not that female characters are completely alone in being stereotyped, of course. Videogame males can be equally two-dimensional, most slotting neatly into the muscle-bound "lone soldier" category. Look around hard enough, though, and plenty of other examples present themselves: George Stobbard, the preppy student hero of *Broken Sword*; Kent the red-haired loser from *Normality Inc.*; Guybrush the geeky pirate failure from *Monkey Island*; and, of course, Mario the plumber. But the truth is, there's no way a short, unattractive female character would ever bag the star role in a game, let alone attain the cult status accorded to Nintendo's main man.

Unsurprisingly, then, women involved in the industry are none too pleased with the way their gender is represented. When Next Generation asked Blake to describe her feelings about female videogame characters,

"Either they're **conspicuous by their absence** or they're the usual fantasy art **wet dream material**"

Kim Blake, producer, Gremlin

Imagine a pair of sweatpants covering Lara Croft's legs. Would *Tomb Raider II* have been as highly anticipated had that been her style of dress?

ng special

her answer was unambiguous: "Either they're conspicuous by their absence or they're the usual fantasy art wet dream material."

Andrea Griffiths, head of PR for Fox Interactive, echoes these sentiments: "Generally, females are portrayed in an overtly sexual way with huge breasts and ridiculously tiny waists. Fantasy as it may be, I find it quite disappointing that degrading and offensive images of female characters are still being promoted in games."

To others, the problem isn't the games themselves. "I love Lara Croft — it's cool that she's a woman, and she's strong and buff. She's kick-ass," gushes Heather Daniels, who edits a game fanzine for girls in San Francisco. "But the marketing department obviously didn't look past her chest."

It certainly seems as though large breasts

Strip puzzle

Even puzzle games are not adverse to the odd piece of gratuitous titillation. Namco's coin-op, *Dancing Eyes*, requires the player to strip away tiles in order to reveal the body of the "cyber babe" beneath.

promoted in this fashion? There are two obvious explanations. First of all, the videogame industry is dominated by men, and the aforementioned "wish list" of female characteristics is perhaps what developers would like to see in real life. The designer of Lara Croft, for example, has often admitted that the *Tomb Raider* star is his idea of a perfect woman (and, judging by the amount

Furthermore, as the vast majority of men's lifestyle magazines have learned in recent years, sex sells. Put a buxom wench in a game and a few saucy renders in the advertising, and the sales of the title are likely to multiply exponentially. As Kate Roberts, animator at Corrosive Software, points out: "Would *Tomb Raider* have sold as many copies if Lara had been wearing a nice warm sweater and sweatpants?" Not only that, but sex also broadens the exposure of a title beyond the videogaming subculture. A significant amount of lifestyle mags and tabloid newspapers have put together "battle of the computer babes" spreads featuring six or seven lusciously rendered women from different games in various states of undress.

"Would *Tomb Raider* have sold as many copies if Lara had been wearing a nice warm sweater and sweatpants?"

Kate Roberts, animator, Corrosive Software

are the major preoccupation of computer artists everywhere. A female programmer at Pumpkin Studios (who wished to remain anonymous) says: "Do women like Lara Croft really exist? Can you imagine the back problems? You would need scaffolding in later life just to keep them off the floor."

So why are the leading ladies in videogames still being portrayed and

of covers she's been on, he's not alone) while Ian Livingstone, designer of *Deathtrap Dungeon* and managing director of Eidos, has similar feelings about Red Lotus. "She's a combination of all the girls who have caught my eye over the past 20 years," he admits. "Not all of these girls were real, though. Comic books have had a big influence on her creation."

And if sex sells magazines, it certainly sells games, or so hoped the brains at Sega that came up with an advertisement last year featuring a totally naked woman covered strategically by product boxes. Eidos has also shown little restraint in its ads, with current spots for *Deathtrap Dungeon* featuring a PVC-clad dominatrix.

Trade shows are another prime example of busty models being used to attract attention to products regardless of their content (although this tactic is hardly limited to the game industry). Almost all of the large-scale stands at E3 had their own harem of scantily dressed girls. But nowhere were these women more obvious than at the massive Eidos stand in the center of the main hall at the recent ECTS, a European entertainment software trade show. Here, the almost understandable Lara Croft-alikes mixed with women in unzipped flight suits (promoting the flight sim *Flying Nightmares 2* — just how irrelevant could Wonderbra-toting models be, exactly?) while hordes of sweaty conventioneers stood around, eagerly waiting to get their pictures taken with the unfortunate specimens.

Fox's Griffiths can barely contain her anger. "ECTS was a prime example of our industry stooping to its lowest. For the first time ever,

It takes very little intelligence for someone to figure out whom some of these videogame advertisements from the U.K. are targeting. The Game Boy ad was eventually banned

the event was visited by a politician," she says. "Barbara Roche, the U.K. Parliamentary under secretary for trade, industry, and small business, was invited by a trade organization to come and see how innovative, credible, and important the game industry has become. My only hope was that someone managed to steer Ms. Roach away from the embarrassing number of stands spilling over with scantily clad females (some topless) surrounded by sad, salivating males. What an impression for her to go away with."

Gina Jackson, a producer at Ocean, questions the usefulness of this kind of advertising altogether. "Eidos and Konami seem to use the 'naked women sell games' routine — especially at shows — but does it encourage people to look at the girls rather than the product? Do these companies have something to hide?"

But are there any positive role models out there? Many would nominate Lara Croft as a decent videogame woman. She's strong, resourceful, intelligent (according to her bio), and her status as main character in *Tomb Raider* puts her a cut above the level of eye candy. It seems that female gamers respond to the character in a strong way; Eidos has received dozens of calls and letters from girls who have enjoyed taking control of a strong woman character for once. "Studies show that girls like playing games with female characters," says Carrie Shepherd, entertainment editor at *MacHome Journal*, "but I think you can identify with a character of either sex if the game is good enough." Susie Hamilton, Core's head of PR, adds: "We do get a lot of emails from female game players and most of them are complimentary — in spite of Lara's visual characteristics, which will naturally appeal more to the male players out there, the female players seem to have found a certain sympathy with her character. Lara represents independence, courage of conviction, and strength, but these have been incorporated into a role which still remains totally feminine. I think that when

Dark Earth's **Delia (right) and a render of a character from the never-released *Terminus* (above, left) share a similar stylistic debt to "fantasy art"**
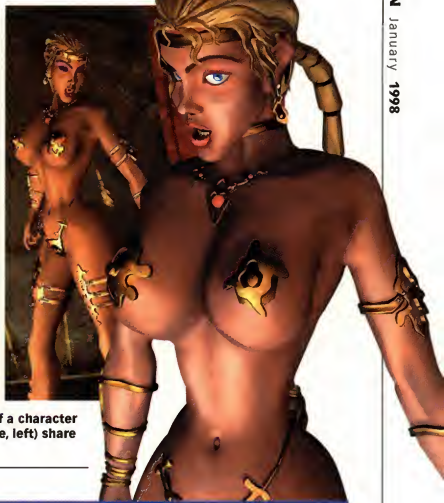
"Although **she is obviously sexy**, she is also a very **strong character**, and being female is actually an important **part of her design**"

Tomb Raider II team

you combine Lara's no-nonsense, go-getting attitude with the above, you get something quite dynamic."

However, as Hamilton concedes, Lara still conforms to the big lips, small waist, big boobs recipe that is rampant in the industry. And Daniels adds, "*Tomb Raider* probably could attract women to games, but I think the ad campaign is going to turn just as many away." And while Eidos is quick to trot out Lara's intelligence and convictions for articles such as this, a recent promotional mousepad featured her leering the word "Meeeeow!" — not exactly a quadratic equation.

On top of that, the massive media hype that her figure continues to generate has no

doubt inspired yet more developers to leap aboard the "perfect body" bandwagon.

An obvious example is Nikki from *Pandemonium*. In the first installment of the game she was a nondescript, girlish character. Recent renders for the post-*Tomb Raider* game, *Pandemonium 2*, however, indicate she has developed a plunging cleavage that even Pamela Anderson would have difficulty competing with. Nikki seems to have a strong personality, though, and she remains a principal character. There are many lesser developers out there who are creating their own Lara Croft look-alikes as gimmicks to incorporate into their ad campaigns; they don't have the imagination to actually develop a personality or to think of what a female character could add to the game. In contrast, the *Tomb Raider II* team insists that Lara has more to offer than her looks: "Although she is obviously sexy, she is also a very strong character, and being female is actually an important part of her design; it means she relies more on agility than brute force to overcome the situations she encounters."

Another recent character to be highlighted as a positive female presence is Twinsen's wife


Nude Raider

While some want to see Lara Croft as some kind of feminist icon, others just want to see her naked. Consequently, there are now several web sites offering doctored renders of Ms. Croft with her trademark vest and shorts removed. Meanwhile, many gamers still believe that there is a cheat in *Tomb Raider* that enables players to play as Lara in the buff. Core denies it, as well as the rumors that it started the rumors in the first place ...
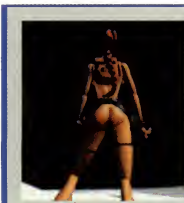
Zoe in *Little Big Adventure 2*. As Griffiths explains, "The two prime movers in the product were husband-and-wife team Frederick and Yael Raynal, and I think the fact that a woman had such a major input is very telling in the game's sympathetic attitude toward women. In the second installment Zoe is pregnant, just as Yael is in real life."

As interesting as the first ever pregnant videogame character is, however, Zoe may be too much of a quantum leap for the rest of the industry to follow. In any case, many would ask why the representation of women should change at all. Men account for the purchase of about 90% of videogames, so why not just keep giving them what they want? As Eidos' Livingstone puts it, "Games other than simulations are not meant to be realistic. They are a fantasy and that's the whole point. Girls in computer games are dream girls and we like
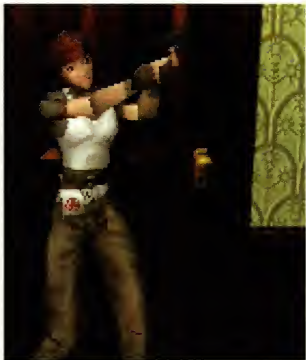
Jill in *Resident Evil* and Zoe in *LBA2* are positive females who don't parade around in their underwear. They're the exceptions, though, not the rule

"I don't mind seeing some big breasts in games, but it's all you see — I think designers need to grow up"

Heather Daniels, editor, *GirlGames*

them a lot. Dream girls are not a new idea. They have been around for years as pin-ups, starred in novels, films, and comic books. Thanks to Lara Croft they have only just started to appear in computer games, and I don't see why it should be a problem. There are enough stereotypical male characters in games as it is."

Interestingly, though, female designers and producers are not asking for drastic changes in the way women are presented. As Blake asserts, "I do think it's fun to have larger-than-life

female characters, just so long as larger-than-life doesn't always refer to their bust!" Griffiths agrees. "If I were to design a female character, she would be good-looking, athletic, and physically in proportion." Even Daniels concedes, "I don't mind seeing some big breasts in games, but it's all you see — I think designers need to grow up."

Intelligence also seems to be at the top of the list of requirements — as Sam Fay, Eidos'

trade marketing manager, suggests, "I'd like to see a female videogame character as the brains as well as the beauty behind the game, one of the sim management titles perhaps, but with Ms. Powersuit running a virtual pub/city/world. She'd also have to be super-intelligent, drink like a fish, command instant respect, and have a great wardrobe!" In effect, no one is asking for an influx of ugly harridans — Fay and her ilk are looking for strong, beautiful lead characters who actually contribute toward the game rather than merely stand in the background looking sexy.

Ultimately, it seems videogame designers have nothing to lose by depicting women in a more flattering manner. Lara Croft, for example, has attracted a fresh, burgeoning audience of female gamers with her intelligence and resourcefulness, but this has been accomplished without sacrificing those undoubted physical charms, which appeal to the male majority of gamers.

If other designers can spend as much time developing the personalities and in-game roles of female characters as they do developing those characters' breasts, they may reach out and tap into this much-neglected audience. Either that, or the industry can continue using female characters merely as marketing tools and slide ever further into misogyny and ignominy.
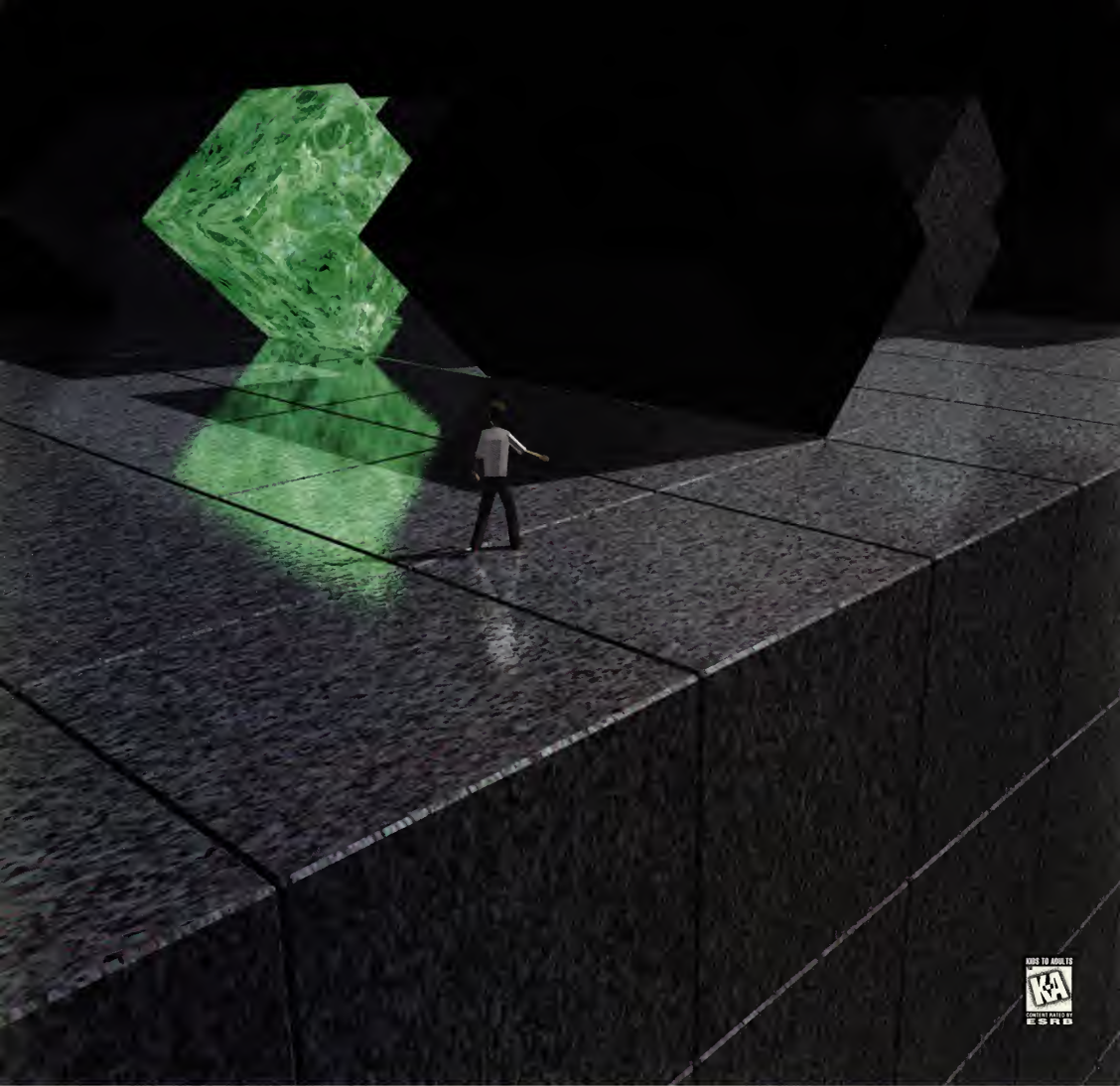
Videogame players are already largely stereotyped as sad, lonely, adolescent dweebs — do developers feel it necessary to add fuel to the fire?

Despite their alleged strength and intelligence, these fighting girls refuse to evolve from their original busty incarnations. In fact, some game makers are designing solely around tits and ass

blockchaikfill

IF YOU'VE GOT A QUICK MIND AND EVEN QUICKER THUMBS, YOU CAN OUTWIT THE GEO-
METRIC TERRORS IN THIS 3-D BRAIN TWISTER AND EARN A SCORE THAT'LL HAVE YOUR
CHUMS KNEELING AT YOUR GENIUS FEET. OF COURSE, THERE'S ALWAYS A FLIP SIDE:
FAILURE EQUALS DEATH. AND ETERNAL DUMBNESS. HAVE FUN.

Only on PlayStation.

Intelligent Qube

alphas

New year, new games

W ith the advent of the new year, we move closer to many highly anticipated software releases — *Resident Evil 2* and *Tekken 3* for PlayStation, *Messiah* and *Wing Commander Prophecy* for the PC, and *Zelda* for Nintendo 64. But beyond the hyped sequels, expect plenty of software surprises in the next 12 months. One of the first will be *Outcast*, a strange third-person adventure by Belgium developer Appeal. Not to be left out of the third-person adventure craze are Square's *Parasite Eve* and JVC's *Iron John Hawk*. If higher-resolution games are among your New Year's resolutions, this is where you want to start 1998.

See the **Next Generation Disc** for more information when you see this symbol

Outcast

No need for a 3D accelerator — Appeal's epic third-person adventure is pushing the gaming envelope in software

Outcast's alien world features some amazing landscapes (right). This smooth, voxel-based terrain has been completely rendered in software

Appeal is taking lighting to the next level. Notice the realtime, pixel-perfect soft shadows on the characters (above left, above right)

W ith a console track record that includes *Waterworld* for the Virtual Boy, not surprisingly, Ocean has been rather quiet the past few years. However, that quiet streak is about to end with a refreshing PC action/adventure game titled *Outcast*.

Not unlike the plot of the film *Stargate*, *Outcast*'s story begins with a portal opening up into a parallel universe. "And a black hole," explains Infogrames Producer Olivier Masclef, "has started growing between this parallel world and our world. So in a real hurry, they send some scientists and you." Players take on the

Outcast takes advantage of its large exterior environments

Format:	PC
Publisher:	Ocean/Infogrames
Developer:	Appeal
Release Date:	Q2 1998
Origin:	Belgium

role of Cutter Slade, a former Navy Seal. Upon their arrival onto the scene, though, they find themselves mysteriously alone — no probe, no scientists, no electric keys. "You are just alone in this parallel world and you've got to sort it out," says Masclef.

From there, players navigate the world from a third-person view. And it's a

visually impressive view at that. "The world is drawn using a voxel-based engine," Masclef explains, "which enables us to have very smooth graphics at a high frame rate. And the frame rate doesn't depend on the complexity of the world, so we can make it as complex as we want."

And complex it is, with detailed open

The camera pans and swings to provide the best perspective, but players can also adjust the distance between the camera and the character

terrains that include temples, mountains, a sprawling city, a swamp, and a petrified forest. From high vantage points within each of these areas, players can see the terrain tessellate out to the horizon.

But the smooth landscape won't be there for the player's enjoyment alone — it will be fully populated. Since the terrain is

Players will find more than ten different gun power-ups, including a flamethrower and mortar-style rounds that really tear up the turf

voxel-built, the design team at Belgium-based Appeal has a greater polygon reservoir for characters than most other developers. The designers are taking the same route DreamWorks has with *Trespasser* (**NG 35**), creating characters with the relatively standard 200 polygon count and using the polygon reservoir to put as many characters onscreen at once as possible. The characters will be skin-covered skeletons and bump-mapped.

So not only should they look good, but the characters in *Outcast* should also move realistically. "We use motion capture and motion blending and skeleton simulation," Masclef says. "We have this system called the animation mixer that enables us to mix five different body animations. You can target with your hand, rotate, and walk around, all at the same time, which creates this sensation of complete freedom when in the game."

Some of these features may sound like standard progressions, but like *Trespasser* and Shiny's *Messiah*, *Outcast* won't require any 3D hardware acceleration. "This is pure software," Masclef assures. He points to the PC running the demo and says, "This is a P200. The minimum machine is a P133."

Not unlike the many other third-person adventures sprouting up of late, *Outcast* will boast its fair share of action. However, Masclef explains that the overall goal is to make the player feel like part of this strange world, which involves a higher level of character interaction. "The game is action-oriented," Masclef says, "but you've got to talk with other creatures in this

100

200

With bump-mapped skins, the polygonal characters boast a level of detail that other third-person adventures have thus far failed to produce

world too. There are a lot of other creatures like farmers, merchants inside of the cities. We've got a system that is called GAIA [Games Artificial Intelligence with Agents], which is a simulation of the civilization. GAIA manages all the interaction between the farmers, the soldiers, and the priests of this civilization."

Unlike standard scripted AI, Appeal's GAIA system adds a realistic depth to nonplayer characters' behavior patterns. The "Agents" referred to in the acronym are preprogrammed instinctual behaviors (i.e., "I want to eat" or "I want to protect myself") that interact within GAIA. Given certain situations, GAIA sorts the proper behavior for that character. For example, farmers may be more passive than guards, so within the game, their willingness to flee from combat would surface much sooner than a military character's.

Featuring a totally nonlinear design, *Outcast* takes advantage of its large exterior environments and varied cast well. The designers also created open-ended puzzles, says Masclef, so players can solve problems in ways other than blasting through them. In one particular situation, for instance, players must infiltrate a fortress to recover one of the components necessary to stop the probe.

"You can just try and enter the fortress," says Masclef, "which is a bad idea, generally. But there are plenty of other solutions. For example, if you attack the local farmers, then the soldiers will go out of the fortress to try and protect them. Or you might try placing mines on

the trail that the soldiers use to patrol the fortress perimeter."

The project has been an ambitious one for the 18-member team, which has been involved with it for almost two years and must squeeze the game into two CDs. The epic-sounding music recorded for the game was performed by the Moscow Symphony, and while dramatically different, it has some of the same inspirational qualities as one of John Williams' scores.

According to Masclef, after years of work, the separate pieces the team has been working on are finally starting to fall into place. "I'm really happy with this strange world we're creating," he says with a broad grin. "It is a mystical world coming to life, awakening day after day. It is really impressive." ng
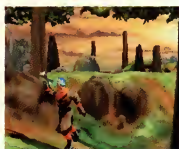
You can ride these bizarre part-camel, part-ostrich creatures (top)

Your character is part of the U.S. military but wears this strange brown cloak. Ocean assures us it's all part of the game
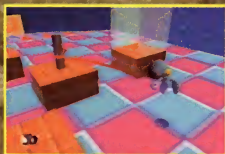
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Iron John Hawk:
The Shards of Power

JVC returns to games with a promising
third-person action/adventure

Format:	**PC**
Publisher:	**JVC**
Developer:	**JVC**
Release Date:	**Summer 1998**
Origin:	**U.S.**

Back in the 16-bit era, JVC was something of a player in the console business, notably as the publisher of a number of LucasArts titles, from *Super Star Wars* to *Big Sky Troopers*. The company's first internally developed 32-bit efforts, *Center Ring Boxing* for Saturn and *Impact Racing* for PlayStation, didn't fare as well, and JVC began to focus development efforts on educational software.

There's still a game group at JVC, though, and *Iron John Hawk* will be its first PC effort. The game is a three-quarter-view isometric action/adventure with a plot taken straight from pulp fiction of the *Indiana*

Iron John will face a number of puzzles and traps that wouldn't seem out of place in an *Indiana Jones* flick, like this scorpion trap

Jones variety. "You're trying to rescue your father, an archaeologist looking for the 'shards of power' on a mysterious island, when your plane crashes, separating you from your companion, Dr. Velda Volanti," explains Project Manager Rick Waters. Finding Velda and the elder Hawk is the main quest in the game, which takes place over 23 levels.

The levels, even at this early stage, look well-designed, and they integrate nicely with the cut scenes and original comic-book-style panels that appear during level loading. The game is mostly fast-paced action, but there's also some focus on the adventure, although the puzzle-solving elements don't look to be any deeper than those of the *Tomb Raider* variety.

JVC looks as if it's emulating the Blizzard model in rebuilding its game development group. Start small, concentrate on making solid, fun games, and success will find you. *Iron John Hawk* should be a good start. **ng**
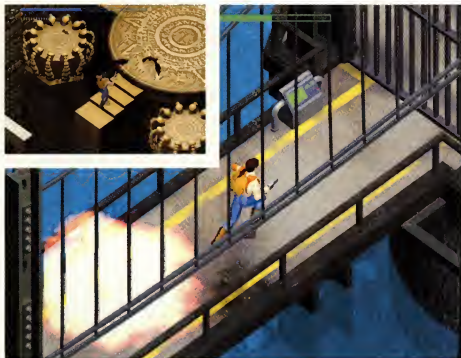
The level design enables fast action, and the programmers have made sure the character doesn't look as if he's skating over the ground
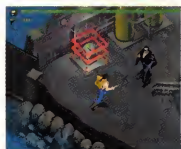
The backgrounds are very detailed; no word yet on 3D acceleration

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Parasite Eve

Undoubtedly, *Parasite Eve* will require players to shoot a countless number of dangerous creatures

In an attempt to diversify, SquareSoft aims its new 3D adventure directly at Capcom's *Resident Evil*

Format:	**PlayStation**
Publisher:	**SquareSoft**
Developer:	**SquareSoft**
Release Date:	**Q1 1998**
Origin:	**U.S.**

It's easy to underestimate the shattering effect *Resident Evil* had on the videogaming community. Prior to its release, many observers doubted the title's potential, yet the result was more than just financial success — Capcom's horror yarn instigated a movement within the game industry that has since seen many a developer announcing its own addition to the third-person adventure genre.

Parasite Eve is SquareSoft's attempt to grab a piece of the action. The game is based on a successful novel, later adapted into a film that was well-received in Japan last year.

Realizing the potential in such a title, SquareSoft has decided to convert the story into a PlayStation adventure, and the project is rumored to be even more ambitious than *Final Fantasy VII*. To ensure success, Square has solicited the services of some of Hollywood's top CGI artists to handle the graphical aspect of the game — Steve Gray, whose credits include *True Lies* and *Apollo 13*, will be directing, while Darnell Williams, a veteran of *Casper*, will handle the art direction. The game is the work of Takashi Tokita, who worked on RPGs *Chrono Trigger* and *Final Fantasy VII*, and while it's being developed by Square in the U.S., the renowned Hironobu Sakaguchi will act as the project's executive producer.

The plot of *Parasite Eve* will differ fundamentally from the movie. Unusually for a Japanese effort, the action centers around different areas of New York — though the presence of a young, blond-haired detective as the heroine isn't too far removed from the norm.

The title was present at the recent Tokyo Game Show and drew much attention from the public despite only being shown in video form on a screen above SquareSoft's stand. However, judging by the quality of the footage, the Japanese RPG master's push into the 3D adventure genre could be something very special indeed.
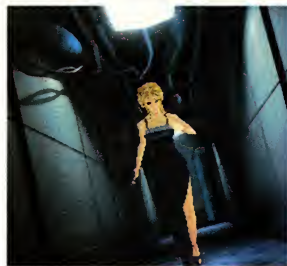
In SquareSoft's take on *Resident Evil*, players will have the opportunity to explore many memorable locations

Character interaction will be an important part of the game

Zelda 64

Link's latest adventure should lend itself to Nintendo's promise of "quality not quantity"

Link has matured (above). As in *Mario*, he will have to explore under water (right), where *Zelda*'s monsters are certainly uglier than *Mario*'s

Some pushing and pulling of walls will be required to solve puzzles

As the most anticipated title for Nintendo 64 draws closer to completion, more gameplay details and screenshots reveal *Zelda 64* to be Nintendo's greatest software endeavor to date. The game, officially set to debut on cartridge, will weigh in at 32Megs — four times the size of *Super Mario 64*. In addition to being the biggest cart Nintendo has ever produced, *Zelda 64* could also be the most innovative.

In Link's journey through the incredibly immense world of Hyrule, it has been divulged that he will travel through time. "There is a place called the Tower of Time where Link becomes a kid," said Shigeru Miyamoto in a recent interview with Japan's *Dengeki 64* magazine. "It's like a double dealing system. He travels back and forth through different times from this place."

Link's physical state will affect his abilities, determining what he can or cannot do. For example, he may not be able to reach a particular area as a child, but through time travel, he could reach it as an adult. *Zelda 64* will also feature an optional full first-person view, making it easier to aim with the bow and arrow.

It's been reported that the environments have been designed so that the Rumble Pak will give off a jolt when

Format:	Nintendo 64
Publisher:	Nintendo
Developer:	Nintendo
Release Date:	Dec. 1997 (Japan), April 1998 (U.S.)
Origin:	Japan

players approach a secret area or hidden item. This would be the first use of the Pak to affect gameplay, as opposed to merely enhancing it. However, Miyamoto did recently comment, "If you use the Rumble Pak and play the game for a long time, your arm would go numb. But Rumble Pak support is still under consideration."

Link, readied with sword and shield, will explore many dungeons. Expect them all to be as detailed and dramatically lit as the one above

Newman Haas
Indy Car Racing

Having licensed the biggest name in Indy Car, Psygnosis continues to prove that there's no such thing as too many racing games

With impressive AI, opponents not only drive cleverly, but carefully too, making huge pileups caused by you a thing of the past

Format:	PC, PlayStation
Publisher:	Psygnosis
Developer:	Studio 33
Release Date:	March 1998
Origin:	U.K.

Expect Newman Haas to strengthen Psygnosis' racing library, which includes titles like Formula One, Destruction Derby, and Wipeout XL

D espite a recent rash of generic, do-it-all racing titles for PlayStation, the best games have always proven to be those focused upon a niche. *Newman Haas* definitely does that. It's an Indy Car/Indy Racing League simulation built around Psygnosis' colossally successful *Formula One* graphics engine. Unfortunately, the game will be without the enhancements found in *F1 Championship Edition*.

Newman Haas is definitely a simulation, a fact that is reflected in the inclusion of rearview mirrors. Although they allow you to see approaching cars, polygon limitations prevented programmers from including the track in reflections, so the cars seem to float in a mysterious ether. Engine noises have been sampled from the real thing, and commentary will be provided by ABC/ESPN announcers Danny Sullivan, a former Indy Car champion himself, and Bobby Varsha.

One drawback, however, is that *Newman Haas* is the game's only official moniker even though 16 of the sport's greatest drivers have been signed up.

The final track count has yet to be decided, and the licensing process is still under way, but expect to see all the Indy Racing League tracks and a couple of

Accurate team colors help provide some of that IRL realism

extra "special" courses featuring the kind of wackiness found in *Motor Toon GP*.

Indy cars and F1 racers are quite similar, so transferring the graphics and physics engine from one to the other is something of a no-brainer. If Psygnosis can also duplicate the quality and fun found in *Formula One*, it may be well on its way to establishing a lasting open-wheeled racing dynasty.

Hybrid Heaven

Konami breaks the string of "Romper Room" games for N64 with a refreshingly mature title

Format:	Nintendo 64/64DD
Publisher:	Konami
Developer:	Konami
Release Date:	Q3/Q4 1998
Origin:	Japan

Konami has arrived as a full-fledged developer for Nintendo 64 just in the nick of time. But don't think serendipity had anything to do with it. Konami has always been a Nintendo developer, and although the company took its sweet time to bring forth its recent crop of titles, no one will forget the company's sensational first effort, *International Superstar Soccer 64*.

Next on deck with hopes of stunning the N64 masses is the company's tentatively titled *Hybrid Heaven*, a game whose origins can be loosely traced to PlayStation. After one of the 50 or so in-house product development employees saw *Metal Gear Solid*, he swore his team could make an even better game. And

HH may arrive on N64 or it may see the disks of the 64DD

although it is a completely different game with an entirely new story (a sci-fi action/adventure game), this N64 game is intended as that team's reply to *Metal Gear Solid*.

About 20% complete, *Hybrid Heaven* may arrive on N64 in cart form, or it may see the disks of the 64DD. Konami told **Next Generation** that characters may be saved and customized, which leads one to think the 64DD might have more of a fighting chance. Either way, Konami says it's too early to know.

While it may be a tentative title,

One of the cooler things about the game is that animals, once manipulated, mutate throughout the course of the game (above)

Unlike *Metal Gear Solid*, *HH* is more of a sci-fi game with RPG elements

Hybrid Heaven is aptly named because it intends to be just that — a perfect blend of role-playing, adventure, and action genres. The game takes players through a dingy, futuristic city and pits the hero against a hostile environment full of freaky mutating creatures not quite fit to appear in the likes of *Blade Runner*.

As Johnny Slader, a special operations leader, players investigate a military experiment gone wrong. Exploration through the dredges of the evacuated city reveals that classified tests, which took place on a space station, have crashed on earth. Left after this experiment are dangerously hostile animals who progressively mutate throughout the course of the game, gaining more beguiling physical characteristics as the game progresses.

According to Konami, gameplay is roughly split between realtime adventure and turn-based combat. Instead of encountering enemies and then switching to a new screen as in *Final Fantasy VII*, camera angles adjust to a side view, and gameplay switches to a turn-based combat sequence. Unlike the action-based *Metal Gear*, *Hybrid* intends

Combat incorporates weapons like explosives and firearms

Konami says combat scenes include punch and kick moves, but it will also enable gamers to use explosives and special learned moves
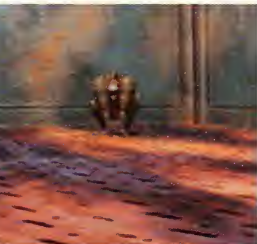
Hybrid Heaven is a bizarre mix of action/adventure elements with a strong dose of RPG touches. Combat scenes are all turn-based

to be more of an RPG that will engage gamers in action and turn-based combat.

As in *Tomb Raider* or *Super Mario 64*, players will control Slader from a third-person perspective, but occasionally this will change for fighting scenes. The combat will incorporate weapons like explosives and firearms, as well as fighting moves. Fighting techniques could very well include counters, and although the game is still in early development, Director Yasou Daikai says new moves may be earned as players gain experience.

While the project is still in its early stages and many elements are likely to change, the grim plot and sophisticated gameplay divulged thus far assures **Next Generation** that *Hybrid Heaven* is one of the few games in development for the mature N64 owner. And if there's to be a *Diddy Kong Racing* and *Banjo-Kazooie* for every *Goldeneye*, Konami's *Hybrid Heaven*, whether flawed or spotless when released, will be welcome more than ever.

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Asheron's Call

Asheron's Call offers players either a first- or a third-person perspective — a first for a persistent online environment

Turbine Games and Microsoft take their stab at the persistent online world — or is it online community?

Format:	**Online**
Publisher:	**Microsoft**
Developer:	**Turbine Games**
Release Date:	**Q2 1998**
Origin:	**U.S.**

The character creation system is among the most complex yet

As persistent online worlds begin to get the attention (and money) of the gaming public, it perhaps becomes inevitable that the world's largest software company is getting involved. And so it is with *Asheron's Call*, Microsoft's entry into the field recently plowed by *Ultima Online* and *Meridian 59*. Currently in development at the Maryland-based Turbine Games, *Asheron's Call* will offer several thousand players a realtime 3D world, as seen from either a first- or third-person perspective, depending on what the player chooses.

So, given the expected success of *Ultima Online*, what is Turbine doing to set its world apart? "This is obviously a question we get a lot," says Jeremy Gaffney, chief technical officer on the project. "Massively multiplayer gaming is qualitatively different from single-player gaming. There's a couple of things. First, we have a real emphasis on social systems, which allows us to do a lot of interesting group dynamics you don't see in a lot of the other systems out there."

It is, in fact, this emphasis on nudging players into social interaction that acts as the driving force behind the game. "One of our absolute bywords is 'incentivize,'" Gaffney says. "We force next to nothing, or at least as little as

possible. The key to running a successful online game is bribing people to do things."

Asheron's Call uses an allegiance system, whereby new players can swear allegiance to more experienced and powerful players. The more powerful player then receives a portion of the new character's experience points. What does the new player get in exchange? Whatever can be bargained for. Lead Designer Toby Ragaini explains, "Because higher-level characters are incentivized to seek out and recruit low-level characters, this means higher-level characters are basically supporting low-level characters. So veteran players are, in a sense, taking on apprentices. They're teaching the players about the game world."

"We end up with a much friendlier atmosphere," Gaffney agrees. "It's very
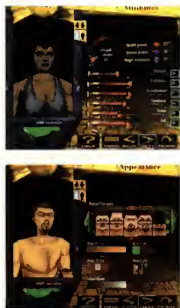
And you know, at the end of the day, nothing beats the feeling of a stout broadsword in your hand, even a virtual one

Avatars are varied and individual, a necessity for such large characters

much a case of you having to bribe those beneath you to join you, not the other way around. That's what's key about this system: It gives the novices a power right from day one that's valuable in the game. Where in most games they tend to be ignored or stepped on, here they're valuable, they're resources. They have something that high-level players want, and that's what's key to making the economy of that whole allegiance system work."

Indeed, nearly every aspect of the game is tied in some fashion to getting groups of players to either cooperate or compete. The magic system, for example, is based on combinations of words, gestures, and/or materials. But the system is set up so that the more individuals there are who use a spell, the less powerful the spell becomes. "This creates an incentive for players who have discovered magic to keep it to themselves, to view it as a piece of information that's valuable," Ragaini explains. "This is really different from other online worlds because with the online game industry, as soon as someone knows something, it's posted to a web page immediately. So this is going to curb that behavior and allow some interesting interaction among players because magic becomes something valuable that they can make deals for."

Players are also encouraged to specialize in one small set of skills, making themselves invaluable to a group that may need, say, an ace lock picker, for example, since concentrating on one

Hopefully the designers have cracked the newbie problem, and new players won't have quite as tough a row to hoe

skill naturally advances that skill faster.

According to Microsoft spokesperson Genevieve Ostergard, the pricing model for *Asheron's Call* "hasn't been set yet, but it's very likely it will be similar to the *Fighter Ace* model." Under this plan, the game client is downloaded for free, and players are charged a flat rate of $1.95 per day or $19.95 a month. Game updates are streamed in as new data every time a player logs on, so new content can be added pretty constantly — and invisibly to the player.

"We've written *Asheron's Call* with the belief that we're going to make our money, and we're going to make our mark by having a game that people are going to play and keep playing for the next five years," Ragaini says. "I'm interested in seeing this product succeed well after it ships. In terms of who's actually adding the content over time, I think that could certainly be on a rotating basis so that it's not necessarily the same people attached to the product for the rest of their lives. This is an obsessive kind of business, and this is an obsessive type of game, and we're not above exploiting our own employees who are prone to those weaknesses. There are one or two employees whom I admire and respect who have professed interest in taking over this product and making it grow and thrive, and who find it tremendously satisfying to cultivate a community. I personally want to be playing it and having fun five years from now, and I'm not going to let it fall down."
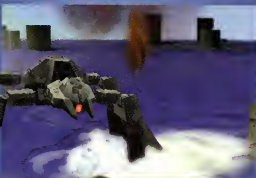

Although not even in beta test yet, imagine this scene with several dozen other players and you get the idea

The online world seems to have a wide range of different terrain

SiN

Forget the visuals, says Ritual. It's the gameplay — and the story — that will make *SiN* stand out from its competitors

With enhanced filtering courtesy of a 3D accelerator board, *SiN*'s underwater levels (above left) have the visual zing of *Mario* and look less like the traditional murky waters seen in *Quake*

Jedi Knight and *Quake 2* are proving that the first-person shooter market is not only still a big winner, but also the supreme ruler among those who've already blocked out memories of life before 3D acceleration. But lurking in the lineup of spring releases is *SiN*, one of many promising contenders ready to dethrone the reigning 3D accelerated champs.

Quite a bit has changed with *SiN* since it first appeared in the August '97 issue of **Next Generation**. Beyond dramatic progress in level design, the name of the developer has changed. "There was another company with the name Hipnotix," says Ritual Producer Joe Selinske, "and it was too close to Hipnotic for copyrighting. So we thought of a bunch of new names, and Ritual rose to the top."

After doing *Scourge of Armagon* (Ritual's first project, a *Quake* Mission pack) and lightening some of *Quake*'s drab brown and olive dungeon levels, the team is ready to bring even more to the visual table with *SiN*. "We want to

Format:	PC
Publisher:	Activision
Developer:	Ritual
Release Date:	March 1998
Origin:	U.S.
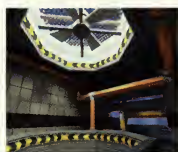
Machines within the levels will animate, like this ceiling fan (above)

Not all of *SiN*'s characters are enemies, and they have been programmed to react differently. But some (above) will still attack you
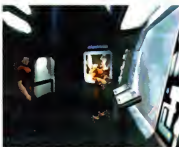
SiN's bright halls and rooms will feature more detail than Quake's

create much more realistic places that you can identify with," says Selinske. "We're not using the same textures for multiple levels," he continues. "We do share some textures, but basically, every level has its own unique set of graphics to create a completely different look for every level." The game will support 16-bit color in software, although to keep the speed up, players should plan on running it on a P150 or higher if they're lacking an accelerator.

But players need more than just colorful eye candy to keep them intrigued as they run and gun through a level. And Ritual is taking design responsibilities seriously. Players are going to be responsible for their actions, both good and bad.

"If you do something on one level," Selinske explains, "it will affect you in later levels. We call this 'action-based outcomes.'" Selinske paints a scenario where if you don't stop a water supply from being poisoned, then a later level will feature tougher, mutant guards rather than the regular security forces who would have been there if they had had fresh water to drink.

"We also want to have a much more interactive environment," Selinske enthuses. "Different levels will let you interact with vehicles. One warehouse level will have this forklift you can get into and drive around. And you'll be able to pick up boxes and stack them so you can get to an area you couldn't get to before. And we're also going to try to have it so you can use vehicles to actually plow right through a door that is locked off."

Unlike many first-person shooters, SiN's story actually advances throughout the levels. These complex hidden docks must be infiltrated

Several environments will also feature high-powered security systems. So players will need to be stealthy in some cases, or face the wrath of overwhelming forces. A skeletal animation system has enabled the team to create an unlimited amount of character movements, and the team is very close to finalizing all the characters in the game. As for the weapons, the developers were dissatisfied with their first crop and have been reworking them for the still-to-be-determined 21 to 25 levels.

In this highly competitive market, the Ritual team knows it has got to deliver something outstanding to even be considered by consumers. Selinske understands this. "We're being different," he says. "We're being unique — that's our main focus."

The game will have full support for all major 3D cards. With native Voodoo² support, expect this scene to run at 60 frames per second

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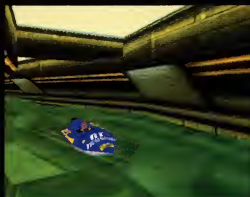REALISTIC WATER PHYSICS CREATE WAKE EFFECTS

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Wings of Destiny

Can Psygnosis take combat flight sims into the future by bringing them back to World War II?

World War II fighter planes are the featured aircraft in this upcoming, action-packed flight sim

As the general standard for PC hardware improves, so too do the benchmarks for the most typical of PC games, the flight sim. *Wings of Destiny* certainly takes a technological step forward, but with the assistance of some rather less sophisticated aircraft, namely World War II fighter planes — Messerschmidt ME 109s and 262s, or if you want to play the good guy, P51 Mustangs or Supermarine Spitfires.

This latest sim comes from General Simulations Incorporated (Ltd.), a company once known by the far catchier Virtek. Not surprisingly, GSI claims that its aircraft physics are the most accurate in the business. What *is* surprising, though, is that this game is to be published by Psygnosis, as the company most recently known for *G.Police* and *Colony Wars* finally dips its toes into the deeper end of the

Format:	**PC**
Publisher:	**Psygnosis**
Developer:	**General Simulations**
Release Date:	**Q1 1998**
Origin:	**U.K.**

simulation pool. Psygnosis' arcade roots are to be reflected in the gameplay, however — the simple nature of the WWII fighters means that the game has a light, arcadelike feel during play, yet it retains complicated missions and very realistic handling.

Visually the game shares a lot with *Flight Unlimited* — accurate texture maps and seemingly limitless views. But that's where the similarity ends. *Wings* is action-packed. With the help of a 3Dfx card (the game will support Direct3D), it's a smooth, almost vertigo-inducing experience. Anyone who has suffered
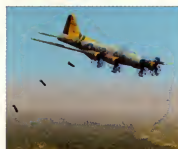
With a 3D card, *Wings of Destiny* is one smooth ride

Pysnosis' arcade background is reflected in the feel of the game

For now, action only takes place in the European skies

through a game of *Microsoft Flight Simulator* might be surprised to learn that flying a virtual aircraft can be a smooth, satisfying experience, as 3D cards provide the flight sim genre with new levels of realism.

Wings of Destiny will support other 3D cards (yet to be finalized), and expect PowerVR to join the list. Currently, the ideal base machine for this game is a P200 with 64MB RAM and a 3Dfx card — making it one of the most demanding pieces of software ever to appear on PC. It will play on a P90, but it still needs a rather fat 32MB of RAM to run.

Although you can play as either Axis or Allied forces, action is limited to the skies of Europe — but look for Pacific operations to appear on later patches or in a sequel. The 50 missions are backed up by a comprehensive multiplayer mode for deathmatch

(dogfighting) or cooperative play. Force Feedback sticks will be supported, and the bumpy nature of the old-school birds should give even the best feedback stick a run for its money. And speaking of old school, the intros and plotlines are put together in cartoon strip form, with stiff upper lips and goggles galore — an interesting variation on the usual flight room crap, but perhaps as equally pointless.

It's interesting to note that Psygnosis, a wholly owned subsidiary of the Sony Corporation, is continually pushing beyond the bounds of traditional action games. *Wings* probably won't end up on PlayStation, and it's refreshing to know that the long arm of Japan has given the company enough autonomy to make the games it wants to make. Maybe that's why this one looks so good.

To look this good, the hardware demands are high — ideally, a P200 with 64MB RAM and a 3Dfx card

RESIDENT EVIL
2

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Bust-a-Move

Not the puzzle game — this genre-buster in the vein of *PaRappa* brings a battle of break-dancers to the console

Movin' and groovin' in time to the rhythm is the way to score points. Significant moves to master include the backspin (left). The bizarre backgrounds (top left) add a *PaRappa*-like quality

With a wide selection of fighting games available for PlayStation, it's obvious that users want to kick ass, but will they want to kick step? Enix is betting that they will with a game in which the polygonal characters don't fight, wrestle, hipcheck, or run for touchdowns. In this game, you see, they dance.

Format:	PlayStation
Publisher:	TBA
Developer:	Enix
Release Date:	TBA
Origin:	Japan

While a break dancing game for the Commodore 64 dates back to the height of the '80s craze, *Bust-a-Move* draws its modern inspiration from SCE's *PaRappa* and Sega's *Digital Dance Mix*. *Digital Dance Mix* was (barely) a Saturn game released last year in Japan. It featured Japanese pop singer Namie Amuro

(Japan's version of Mariah Carey). Players had to choreograph Amuro's moves and then execute them. Unlike *Digital Dance*, though, *Bust-a-Move* presents a far more competitive arena.

As in old-school breakin' competitions, two players duel on the dance floor in an attempt to outperform the other with the best dancing combos. (No word yet on whether or not there will be user-selectable linoleum mats on which to dance.) Players can select one of twelve polygonal characters, each representative of a different music style. Of course, there will be characters to represent disco, rock, and techno. Regardless of the character style, though, all the music in the game will be very lively and hip-hop based. Hip-hop is extremely fashionable in Japan today, and it's obvious the designers are shooting for a high-energy vibe to compel the player to bust the best moves possible.

The game will also take advantage of 3D environments. The dynamic camera

Bust-a-Move's cast of twelve boasts a few strange characters

The characters, while detailed, reflect a cartoony, anime-style design. Notice how the dancer in the above center frame has a thumb yet no fingers

spins freely around the dancers to give players views that would make the director of MTV's "The Grind" salivate. Notably, the backgrounds are very colorful, featuring graffiti-painted walls and some fantastical settings. As in fighting games, competitors will have their own stage and unique moves.

Interestingly, *Bust-a-Move* is one of several expected 32-bit titles from Enix. After years of developing mostly RPGs for Super NES, the company announced 32-bit software when Nintendo 64 delays didn't make it economical for the company to wait. Enix's upcoming PlayStation lineup includes a 3D action

game and the continuation of its *Dragon Quest* series.

While there are few titles like *Bust-a-Move* out there, the Japanese have already coined the term "rhythm/action games" to describe the burgeoning genre. Hopefully Enix and other developers interested in breaking into this rhythm/action realm of gaming will look to *PaRappa* for inspiration and guidance. In an era where the multimedia schlock of the *Marky Mark: Make-my-Video* mold can spoil an entire market, let's hope Enix maintains the freshness that *PaRappa* brought to gaming.

The dynamic camera, which zooms in for some funky angles, amplifies the game's attitude. Escapees (above right) from the *X-Files* game?

Contemplates of Retirement.

EARTHWORM JIM 3D

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HOMETOWN: Portsmouth, VA

RANK IN NET FIGHTER: 2nd

DEGREES EARNED: 197,500, traded 17,500 to buy Scud: Industrial Evolution™ in the HEAT store

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finals

Reviews done for readers, not PR flacks

This issue marks our first online-only persistent world game reviews. Our policy will be to review online-only games when they release, and to rereview them if substantial revisions — new worlds, new interfaces, etc. — are added. As always, we welcome your comments.

★★★★★ **Revolutionary**
Brilliantly conceived and flawlessly executed; a new high watermark.

★★★★ **Excellent**
A high-quality and inventive new game. Either a step forward for an existing genre or a successful attempt at creating a new one.

★★★ **Good**
A solid and competitive example of an established game style.

★★ **Average**
Perhaps competent — certainly uninspired.

★ **Bad**
Crucially flawed in design or application.

CD Denotes a review appearing on the **Next Generation Disc**.

🔴 Denotes a review of a Japanese product.

Nintendo 64

Automobilia Lamborghini 64
Publisher: **Titus**
Developer: **Titus**

This holiday season will be many companies' first go with N64 games. Unfortunately, the many changes to this title since its inception show that nailing down development for N64 takes time.

One of the more beautiful racers in what is hands-down the most filled-out genre for the system, *AL64* contains the full Lamborghini license and includes accurate renditions of several Lamborghini models, plus cars from other manufacturers like Dodge and Porsche for a total of 24. The cars drive decently, with quick turns, snappy brakes, and smooth acceleration. Also, the cars drive through some of the nicest-looking backgrounds yet seen in an N64 racing game, with a few shortcuts here and there to perk up gamer interest. Several modes (Arcade, Tournament, Championship, and Time Trials) add variation to just straight racing.

AL64 supports the Rumble Pak and is also a four-player game, two elements that held the game back from an earlier release — which helps to put it squarely in competition with many of the other good racers currently available.

Yet somehow the game just doesn't

Although one of the best-looking racing games on N64, *AL64* still isn't anything to rave about

have that crucial edge that could make it great. It's got all the right elements — good AI, a decent frame rate, a generally good feel — but they never quite gel into a completely satisfying whole. It really needs a better sense of speed and more tension, or at least some unique element besides its dream-car license to set it apart. *AL64* makes a decent rental, but even at Nintendo's recently lowered prices, it's no steal.
Rating: ★★

Duke Nukem 64
Publisher: **GT Interactive**
Developer: **3D Realms/ Eurocom** **CD**

Duke Nukem, the personality of the urban apocalypse, has reared his grinning head, and having (predictably) cleaned up his act, has made his appearance on N64.

For those who haven't gotten enough of the genre, *Duke Nukem 64*, still equipped with clever but less sexually evocative quips, is the fifth solid first-person shooter to grace N64. Strippers are now meant to be rescued, and much of the game has been cleaned up. However, in all, the game hasn't lost too much of the mood that makes *Duke Nukem* so much fun.

This version is a semi-port, featuring new weapons but taking levels from the original PC title and a few from the expansion packs. It does features some original levels. Polygonal backgrounds are adequately texture-mapped while aliens are made up of sprites that look better than those in *Doom* and *Hexen* but still look clearly like 2D bit-maps, giving this slightly outdated title an outdated look to match.

Cool lighting effects, seen in most explosions, help the graphically challenged *Duke Nukem 64*

But despite the antiquated look of the game, there is still some good fun to be had. One to four players can compete against one another in four-player, split-screen action. The sound effects and music are solid, the levels are still interactive as heck, and it's never quite felt so good blasting enemies with a shotgun or blowing them to chunks with pipe bombs.
Rating: ★★★

Extreme-G
Publisher: **Acclaim**
Developer: **Probe** **CD**

The first third-party publisher to really tax the Nintendo 64 engine (with Turok), Acclaim has again shown it knows how to make an N64 game shine. A highly *Tron*-like experience, clearly influenced by *F-Zero* and *Wipeout*, *Extreme-G* brings gamers fast, futuristic, heavily armed speedbikes that careen along roller-coaster tracks in some totally hallucinogenic scenarios.

The bikes are super streamlined, highly intricate vehicles capable of picking up weapons (a la *Wipeout*) and blasting opponents to slow them down (in all modes, including Time Trials, Shoot 'em up, and Extreme Contest). The weapons could have played a bigger part in winning all races, but instead, Acclaim has limited this option to just Extreme Contest.

The game has a fairly steep learning curve, and most gamers will just wrestle with controlling the mechanical beasts initially. Players can expect to spend time bashing against guard rails for a while before mastering the bikes.

Overall, the graphics are quite awesome. With a high frame rate and gorgeously detailed backgrounds, it's no

Play Battle mode to get the most out of *Extreme-G*, an extremely gorgeous racer

wonder Probe had to bring in a bay full of fogging effects — which will remind many of Turok and may prove nearly as claustrophobic. The lighting effects are particularly notable. The techno music isn't highly original, but it actually does turn out to be effective racing music, and the sound effects do the job, especially when weapons are launched and hit their targets.

Extreme-G supports one to four players, but the real meat of the game is

Cute in **overdrive**

The latest from Nintendo and Rare goes *Mario Kart* one better

Realtime specular highlighting makes this game look amazing. Among other things, accumulative power-ups differentiate this from *Mario Kart*

Diddy Kong Racing
Publisher: **Nintendo**
Developer: **Rare**

Nintendo and Rare's latest is one of those games that gives skeptics and cynics a good laugh — at first. *Diddy Kong Racing* takes the grossly popular *Mario Kart* racer, adds two new vehicles, and plants the game in a platform framework, giving it the appeal of an "adventure." It's an interesting blend of elements, and even though both halves of the game are entirely derivative in nature, the combination works well.

Diddy Kong Racing shows Rare's pure craftsmanship, displaying keen subtleties that eventually win players over. The basic mechanics of *Mario Kart* have been fine-tuned, and in some cases they have been improved upon. Power-ups can now be collected for increased benefits (three speed bursts triple their effectiveness, for example), and the graphics are smoother and crisper than in *Mario Kart*.

The vehicles come in three flavors: kart, hovercraft, and airplane. Each maintains its own feel, with the plane and hovercraft tipping their hats to *PilotWings* and *Wave Race*, respectively. The kart is familiar while the plane's tight controls, loops, and sharp turns make it the clear favorite. The initially annoying hovercraft symbolizes the game as a whole — the learning curve is steep, but in the end the subtle feel and

control are just short of greatness. Karts can lift up on two wheels and pull off near-90-degree turns, killer moves that suit the game perfectly.

The game pits the three vehicles against one another on various courses while pairing similar vehicles in others. Missions range from rescuing eggs from baskets to collecting silver coins to racing end-level bosses. Almost every course is cleverly designed for all three vehicles, playing to each vehicle's strengths and weaknesses in turn. Most tracks are quite short, but they're elaborate and detailed. Single-player races and multiplayer "deathmatches" are both fun, and those who were angered by *Mario Kart*'s cheating AI will be relieved to know that pulling ahead of the pack in *Diddy Kong Racing* means staying there, no artificial catch-up included.

The graphics are a step above all other N64 games and take advantage of Realtime Specular Highlighting, a fancy term for clear, high-gloss detailing previously unseen on consoles. It's very pretty — players can see the sun reflecting off a plane's wing, the curve of a character's fingers, or the shimmering surface of the water.

It's too bad the characters are so pathetic and obvious, molded from the same cookie cutter as Banjo-Kazooie and Conker of *Conker's*

Quest. Come on, Pipsy the mouse? Suffice it to say, each animal owns up to its physical characteristics — smaller ones are lighter weight and accelerate faster while larger racers are less likely to get bounced but also take longer to speed up.

Tightly designed and well-executed despite the cloying cuteness, in the end *Diddy Kong Racing* is one that grows on you.
Rating: ★★★★

One of the most annoying vehicles, the hovercraft is actually amazingly fun in time

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in the straight one-player Extreme Contest and racing modes. For some reason, four-player *Extreme-G* Bike deathmatches — while a decent idea — just didn't pan out.
Rating: ★★★★

Mace: The Dark Age
Publisher: **Midway Home Entertainment**
Developer: **Atari Games**

What's amazing about Nintendo 64 is its completely pathetic fighting game library.

While a good game in the arcades, *Mace* didn't port as well as could be hoped

The best fighter to hit Nintendo 64, *Mace: The Dark Age*, would still get pounded into the ground by any PlayStation or Saturn fighter game.
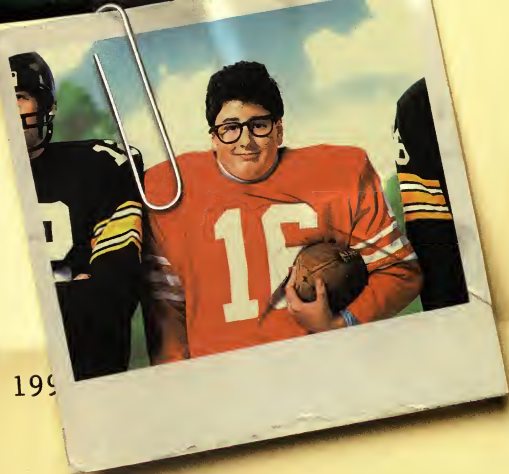
Ported from a good, respectable first try in the arcades, *Mace* is a medieval weapons-based fighter with characters that range from sheiks to blind monks to Vikings, dwarfs, skeletons, and executioners (and a janitor). It's a real mixed bag of folk, strangely characteristic of the overall uneven gameplay.

The blend of *Street Fighter* and *Mortal Kombat* move schemes works out OK, although it seems the game is more

effective when players puzzle out built-in combos than when they string together a great set of solo moves. Funny little details like the characters' voices, damaging perimeter environments (lava, acid water, spiked floors, etc.), and a swinging blade in the Executioner's level add character and color to a game that can use every bit it gets. The music is awful, but the sound effects are a lot of fun (check the hundreds of sound samples in the options menu for a laugh).

Mace, the N64 port, is far from being the smooth, respectable fighter it was in the arcades. Instead, gamers will

October 27, 199

Dear Coach:
I'll never forget you. The way you told
me I was a fat lard. How hard you laughed
at my lisp. The way you summed up my
potential in two words, **marching band**.
Coach, I can't thank you enough for
telling me I'd never play NFL Football.
You were my inspiration. And if you're
ever in town, I'd love to return the
favor and **kick your hairy butt** up and
down the gridiron.

Your former fatso,
Hooper

Acclaim's NFL Quarterback Club '98 on N64

You're never too fat to play NFL Football.

*Available for N64 & PC/CD ROM

*PC/CD ROM

*PlayStation

*Genesis

*PC/CD ROM

*PC/CD ROM, Saturn
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*PC/CD ROM

*PlayStation

Do you want real NFL action? Real NFL players? Real NFL battles and hard-core intensity? Well, now the NFL gives you eight great ways to Sunday. Including Acclaim's NFL Quarterback Club '98 available on Nintendo 64. So get into the spirit of the season and get your hands on some real NFL Football. 'Cause if you got a game, you can play NFL Football. (No matter what anybody else thinks.)

FEEL
THE POWER

rating

Nintendo 64

immediately sense the choppy frame rate, as well as the overall lack of balance between characters. Ironically, and this is especially disappointing, it's still one of the best fighters on the system to date.
Rating: ★★

Madden 64
Publisher: **Electronic Arts**
Developer: **Tiburon**

The one name synonymous with videogame football is *Madden*. Ever since its burgeoning days on Genesis, EA's *Madden* series has led the way. On PlayStation, Sony's impressive *GameDay* has unseated the former champ, but on N64, *Madden* gets another chance.

However, *Madden 64* doesn't take advantage of the opportunity and can't even claim to be as good as the PlayStation version. The key differences from the PlayStation game are the polygonal players and lack of an NFL license. The polygon players look nice, but the lack of logos or proper color schemes is nearly criminal for a football simulation. The developers also fail to take advantage of polygonal 3D players like the ones in *GameDay '98*. Instead, the game plays nearly identically to a sprite-based game, meaning the

Without the NFL license, *Madden 64* is unable to place the logos and team names anywhere, a horrible waste of polygons

polygons have little to no value. But perhaps the biggest problem with *Madden 64* is the control. As in all *Madden* games, the players move around as if they're on ice. Add to that the analog control, and the level of frustration quickly rises to intolerable.

Despite its lack of merit as a serious football game, *Madden 64* is the fastest-playing N64 football game around and as such is just slightly better than *QBC 64* as an arcade game.
Rating: ★★

QBC 64
Publisher: **Acclaim**
Developer: **Iguana Entertainment**

Until EA's surprise announcement of *Madden 64*, it looked as if Acclaim was going to have the only football game on N64. Perhaps that explains why the developers were unable to make steps forward in the *Quarterback Club* series. Last year's PlayStation game was a huge improvement for the downtrodden series, even adding a touch of innovation to the genre with wrapping tackles. This is not, sadly, another step forward.

Whether the end result had more to do with laziness or the trials and

Some poor animation really hurts the look of *Quarterback Club*, but the creeping pace is what really kills it

tribulations of working on a new platform, *QBC 64* just doesn't fulfill its promise. The high-resolution mode of N64 is used for the first time and effectively takes away that nasty N64 blur we've all become accustomed to. In the process, however, the speed of the game suffers seriously. In fact, that is the main problem with *QBC 64*: It's just too slow.

Everything else in *QBC 64* is on target. The NFL license, stats, simulation features, general manager functions, control, and even the AI are as good or better than those in *Madden 64*. In the end, serious football fans may want to stick with *Quarterback Club* for its realism, but the slow play is likely to drive gamers crazy.
Rating: ★★★

Top Gear Rally
Publisher: **Midway Home Entertainment/Kemco**
Developer: **Boss Games Studios**

Boss Games has pulled off a truly amazing feat with *Top Gear Rally*. While numerous rally-style racing games have shown up on home systems since Sega's pioneering *Sega Rally Championship*, none has ever beaten that game at what it does best — simulating drifts and powerslides in high-powered cars on mixed on- and off-road courses.

Boss' game meets or exceeds everything good *Sega Rally* came up with, then adds some twists of its own. Players can choose from season-long Championship mode, Time Attack, or Arcade. They can also race in sunshine, rain, night, and snow, and each change in the weather affects the way you race. New cars are won each time a season is beaten, so finicky players may need to play through to the second season to get a real feel for what the game has in store.

Top Gear Rally is second only to San Francisco Rush in the N64 racing game pantheon

The graphics are some of the cleanest seen on Nintendo 64, although many textures are repeated too often or unrealistically (perfectly symmetrical, raked dirt roads just don't cut it all the time). The cars, which can be painted and customized (a nice touch other games will doubtless copy), take physical damage — a feature absent in *Sega Rally*. The damage doesn't really affect the control, but the tough courses often result in major flips, crashes, and phenomenal wipeouts. As mangled as the cars often end up, this is fun all on its own. What's more, there are nasty little shortcuts that make players pay if they're not good enough to take them.

Unfortunately, the game's few problems are big ones. Slowdown is unavoidable, occurring even when two cars appear on screen — and no more than two ever appear at one time. The sleepy two-player mode is awkward and not at all fun, and the music, which seems as if it was stripped straight out of an 8-bit racing title, just plain sucks. Had these elements been stronger, *Top Gear Rally* would've scored a perfect five. But make no mistake about it: This is a fabulous off-road racer with tons of bonus cars, courses, and replay value to make it a keeper — second only to *SF Rush* on Nintendo 64.
Rating: ★★★★

PlayStation

Armored Core
Publisher: **SCEA**
Developer: **From Software**

The image of the Japanese mech is a compelling one, deserving of its icon status in gaming. The ability to become one with a sleek and dangerous piece of machinery, augmenting yourself into something better, is a classic theme in science fiction, and one that resonates deeply in the Japanese culture. In this third-person action game from From Software, as in Sega's excellent *Virtual On*, players get to fight with nimble mechs, but unlike the latter, *Armored Core* offers well-designed missions to

flesh out the gameplay.

As a mercenary for hire, players

Intense action and a brilliant two-player mode make *Armored Core* well worth looking into

choose their own missions. Each assignment completed results in a handsome cash reward, used to upgrade one's mech, or Armored Core. Of course, the more damage taken during the mission, the more expensive the required repairs.

The amount of options for mechs is impressive: Players can change everything from the type of head right down to the color and pattern of the shell. This obsessive attention to detail is fascinating and helps pull you into the sci-fi world of the game.

The missions themselves are basic stuff, generally involving eradicating rebels or protecting a strategic location,

but the action is intense. Once mastered, the controls (which use every controller button) enable an impressive feeling of power. In the two-player game, the arenas are immense and vary in locale from a wide-open desert to a downtown city. True, the vertical split screen can only show so much, and there's no link option, but it still gets the job done.

Armored Core isn't perfect: The graphics, while crisp, do lean a little to the bland side, and turning around can be sluggish. Still, the strength and depth of the gameplay are enough to make *Armored Core* a winner.
Rating: ★★★★

PlayStation

Crash hit

Crash 2: Cortex Strikes Back
Publisher: **SCEA**
Developer: **Naughty Dog/Universal** (CD)

Sony's "unofficial" mascot hits his stride with a gem of a sequel

I n the 1996 "mascot war," Mario clearly dominated. But somewhere amidst the symphony of praise for new camera angles and analog control, Sony's mascot entry, Crash Bandicoot, won a large albeit quieter following among gamers who preferred using old-school gaming skills to satiate their appetites. Essentially a 3D engine featuring classic 2D gameplay, *Crash Bandicoot* relied more on tried-and-true elements of rhythm, timing, persistence, and skill to draw gamers into his world and teased them with 3D-ish graphics wrapped around a track-based engine.

This time around, Crash continues his fight against his arch-nemesis, Dr. Neo Cortex, but developer Naughty Dog seems to have gotten a better handle on things. New additions include multiple paths, quasi-nonlinear areas, branch sections in several levels, new abilities for Crash, and a rather complex series of level structures. These features successfully improve upon some of the limitations of the first game without sacrificing the snappy control and personality that made the original an endearing, if highly derivative endeavor. Crash can now ride a jet ski, race on the back of baby polar bear, and fly around with a rocketpack. Although the game is still at heart a track-based adventure, the developers have tacked on more challenges and multiple ways to approach some rather quizzical obstacles during levels. (i.e. "How the heck do you reach *that* gem?") The challenges are instantly familiar to anyone who knows what Radical's Ian Verchere calls the "grammar"of games, but that doesn't make them easy, nor did we find this episode as derivitive as the first *Crash*. Timing and rhythm are still at the core of gameplay, and now the gamer will have to master and remaster each level in order to fully complete the game and reveal all the secret areas.

Still graphically superior to its competitors on PlayStation (we'll let Usenet argue the relative merits of *Crash*'s tightly textured environment vs. *Mario*'s smoothly shaded world), *Crash 2*'s seamless high-res polygonal graphics allows character movement at a quick pace,

Crash's little sister Coco seems to have replaced his mysteriously missing girlfriend Tawna in his second outing on PlayStation

focusing in on character control and clever animation. It seems that Naughty Dog has discovered some secrets inside the PlayStation graphics engine that other companies haven't quite tapped into yet.

Yet when all is said and done, *Crash 2* boils down to a mix of crystalline graphics, challenging gameplay, and a distinct framework of levels. Although arguably a triumph of style and design over substance, it's precisely this tight design that makes its mild innovations stand out over the original. *Crash 2* is a tempting gameplay treat, one that frustrates at times, but it always rewards a job well done — and that is an addictive combination for any serious platform gamer. Recommended.
Rating: ★★★★

Each level presents its own unique challenge. Taking a page from certain other games, you must return to each level more than once in order to achieve a 100% completed game

Bug Riders
Publisher: **GT Interactive**
Developer: **n-Space**

Sometimes in the race to create a new game, what looks good on paper may not end up transferring well to the screen. GT Interactive's *Bug Riders* is a good example of this. It looks decent enough, and the idea — racing giant bugs — is original. It's just not that fun.

The emperor of the planet Entymion (from the Latin for insects, get it?) is dying, so a bug-riding race is held to determine who should be the next leader. The premise has some promise, offering all sorts of new gameplay ideas like riding living creatures and flying through the air. However, these same ideas, at least the execution of them, are what bring the game down.

To make a giant bug go faster, players must beat it with a crop, jockey style. If this sounds unpleasant, well, it is. Whip it too vigorously and it will cry out

If riding atop a cantankerous insect is your forte, boy are you in luck. If not, avoid *Bug Riders*

and slow down. Take it too lightly and it won't go fast enough. It's very difficult to find the correct rhythm. To compound the situation, other riders are constantly shooting at you from behind, impeding your progress and antagonizing your bug even more than your over-eager crop.

The six tracks in *Bug Riders* take place over water, through forests, and around other such fantasy-based locales. The tracks are nice-looking, if a bit short, but it's often difficult to tell where you're supposed to fly next. Even when the correct path is obvious, the bug may not want to turn that way just yet, which brings up another big problem. The bugs have a mind of their own, which is an interesting idea, but getting the bug to do what you want is more frustrating than it's worth and drains all the fun out of the race.

Kudos to GT Interactive for trying something new, but next time stay away from the bugs.
Rating: ★★

Clock Tower
Publisher: **Ascii**
Developer: **Ascii**

At first glance, *Clock Tower* seems like pretty standard fare: a point-and-click

Consequence of Rank - As you progress from the rank of Cadet to Captain, you'll go from taking orders to giving them. The power & the responsibility of commanding an entire fleet of ships will be yours.
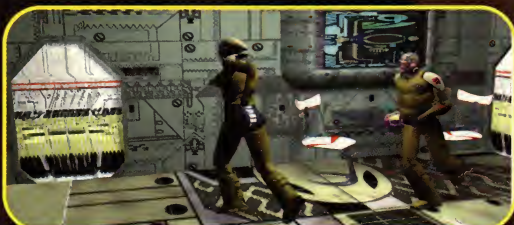

Consequence of Action - It's not just if you win or lose, or even how you play the game. Everything you do determines how the game is even played at all.
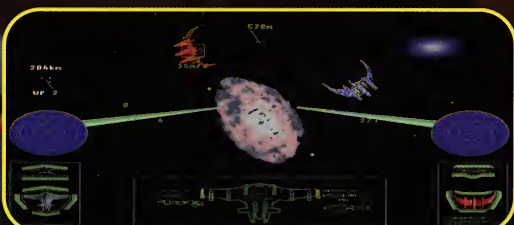
Roshambo Combat Strategy - Space combat with a twist. Your ship is a rock. Another is paper. Another is scissors. You can't beat them all & they can't all beat you. Plan your attacks accordingly.

A Thickening Plot - With an unparalleled depth of play, set against out-of-this-world SGI graphics, figure out a constantly changing story as you maneuver & master four fighters, while dealing with three different alien races.

forced alliance II

Orbital Studios Inc.

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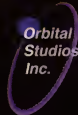
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Return
of the goddess

Eidos changes almost nothing and still comes out way ahead of the pack

Tomb Raider II
Publisher: **Eidos**
Developer: **Core**

Mowing down enemies and flying over treacherous drops on the snowmobile produce a rush like no other in *Tomb Raider II*

The release of *Tomb Raider* in '96 single-handedly propelled Eidos to the forefront of the videogame industry and shot the game's heroine, Lara Croft, to virtual superstardom in a matter of months. With an incredible level of control, unparalleled level designs, and a main character who captivated adolescent males by the thousands on the strength of her live ammunition and unimaginable physique, the game has yet to be challenged by a worthy competitor in the same genre. Relying on this past

Lara does a little runway modeling to emphasize the more cosmetic side of the sequel's subtle changes

success and hurried along by the constant din for the return of Lara, Eidos has rocketed back into the spotlight with the release of *Tomb Raider II*.

On her second venture into the spoils of ancient splendor, Lara begins as an individual on a mission rather than the paid plunderer-for-hire of last year's title. While on a trip to fetch a legendary emperor's sword from the Great Wall of China, she is abruptly derailed and sent on an international journey to uncover past secrets and the true path to the sword. An interesting storyline, but nothing particularly as involving as what's already been done in other games. Let's face it, we're not here to be sold on the character's motivation. The majority of gamers want to relive the experience of *Tomb Raider*'s gameplay while still others are lured in by a desire to witness the return of a gaming legend in action. It's as simple as that. Fortunately for those gamers, Eidos has decided to make a solid game in the meantime.

On first impression, we're sucked back into the world of the first game, with little to no noticeable change. The game controls, maneuvers, and unfolds much the same as the last time, with only subtle adjustments. The environments and levels are more complex in design and massive in structure, requiring more exploration and an early mastery of the controls. Indeed, in this regard, it's clear the designers at Core are pitching the sequel squarely at those who completed the original, offering a suitably high degree of difficulty and some surprising challenges.

The graphics remain very much the same, with only the cosmetic nuances of added polygons smoothing out some (ahem) jagged areas. Lara's enemies have shifted from denizens of the animal kingdom to big, bad thugs toting various forms of torture and firearms. Lara herself has a few new moves, and a couple of new weapons, and she can

even drive vehicles, although most of the gameplay and design will seem pretty familiar.

However, if the game is so suspiciously similar to the original, then why is it still being recognized with such commendations a full year after the original's release? You would imagine that fast-paced industry technology would force such a game into extinction, making any simple redressing of a past game into a bogus redux. But this doesn't happen with *Tomb Raider II*. True, in some ways it's close to being a clone of the first game, but there're just enough subtle additions and filling in of detail to expand on the original and make it work — and work brilliantly. *Tomb Raider* certainly left us wanting more, instilling a hunger to once again be immersed in Lara's world and to join her treasure-hunting exploits. Eidos and Core have provided both with this first sequel, and nailed it dead on.
Rating: ★★★★
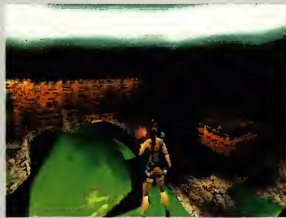
Level designs can be just the teensiest bit daunting at first glance. But it's all in the gameplay

graphical adventure. First impressions, however, are deceiving. Yes, it has everything we've come to expect from a PlayStation graphic adventure, including a slow pace, animated cut scenes, and voice acting that's only marginally better than *Resident Evil*'s. But two things make this title one that all gamers should check out. First, the backstory, based on a Norwegian horror tale, is better than most.

Second, Ascii has added a totally innovative element to the game. As players progress through the game (which has a number of characters, with four or five endings per character), trying to solve the mystery

of the "Scissorman" murders, there are frequent encounters with Scissorman himself — a slumped over mutant with

The horror of dodging the Scissorman makes *Clock Tower* a creepy delight

a five-foot-long pair of scissors intent on killing you. (In the best horror film tradition, you're always alone.)

Scissorman's arrival is preceded by ominous music, which helps create an amazing sense of mood, as well as plenty of nervous anticipation. When he finally arrives, players can try to run, or hit the panic button, which might — might — allow them to safely hide behind a convenient item like a filing cabinet. However, while he may be fooled this way once, he catches on fast. Trust us, when the Scissorman music kicks in and one is faced with a dead-end corridor and an already used hiding place, the amount of sheer

tension generated cannot be overstated.

The new play mechanic introduced by the presence of the wandering Scissorman means that the experience of playing *Clock Tower* is far more intense and, to use an overused word, immersive than other graphic adventures, on PC or PlayStation. Even *Resident Evil*, with its focus on shooting things, can't deliver the creepy feeling *Clock Tower* does. The slow pace knocks off a star (as does the voice acting), but this innovative, intriguing effort is well worth a look.
Rating: ★★★★

PlayStation

Cool Boarders 2
Publisher: **SCEA**
Developer: **Uep Systems**

The first *Cool Boarders* game, while pure in its intentions, was unfortunately flawed in execution. It was more of a downhill racer than a snowboarding game, and it failed even in that capacity due to a lack of other boarders to compete against. Thankfully, developer Uep Systems has added these and more to the sequel, making *Cool Boarders 2* a better, though not perfect, snowboarding game.

The number of options has been greatly increased. Choose from among seven male and female boarders, each decked out like a member of the Beastie Boys or Luscious Jackson, respectively. There are a whopping 18 boards to ride, although the performance difference between them is hardly noticeable.

The most apparent change, however, lies in the downhill physics. Ricocheting off the sides of the tracks is

Cool Boarders 2 **is uneven, but the half pipe mode is so good, it's almost worth a lift ticket**

much more realistic this time around, with just a slight slow-down rather than the dramatic bounce of the first. Gliding straight downhill is accomplished well, although poor level design can sometimes conspire to slow players down with long, flat sections of track.

But for the real snowboarding experience, skip the downhill and aim straight for the half pipe. The sheer joy of spinning around more times than you can count while grabbing the edge of your board completely eclipses any minor downhill thrill. Snowboarding has always been more about tricks than racing, and the cliff jumps in the first didn't do this aspect justice.

Unfortunately, these few changes haven't succeeded in making *Cool Boarders 2* the game it should've been. The graphics are still choppy, with glaring black seams interrupting the white tracks, and the track design is less than inspiring. However, the half-pipe mode is so much fun that it makes you almost overlook the game's problems. A definite mixed bag.
Rating: ★★★

Courier Crisis
Publisher: **GT Interactive**
Developer: **New Level Software**

Pedaling through a busy city as a bike messenger — one of the more potentially hazardous, "extreme" jobs a person can have — could've made an amusing part of a larger game. Perhaps it would've worked as a bonus level in a game involving all kinds of package delivery, something like *UPS Strike!* But as it stands, with only the bike to ride, GT Interactive's *Courier Crisis* feels like an incomplete game.

Players begin the game as a rookie, picking up a few packages from businesspeople on the street and delivering them. It begins simply enough, with only a few obstacles like pedestrians and traffic to avoid. However, as the game progresses, traffic gets heavier and the passers-by meaner.

The cities are completely 3D with sidewalks, alleys, and shortcuts. However, getting around this 3D city is a different matter. The bike handles terribly,

The terrible control and poor graphics of *Courier Crisis* **give bike messengers a bad name**

responding to turns as if it were being ridden through sand. There's a quick-turn button, but this turns the bicycle so sharply that players invariably end up stuck facing the wall.

Graphically, *Courier Crisis* is just as bad. After more than two years to get to know the machine, there's just no excuse for these kinds of glitchy, clunky games.

The *Road Rash*-like violence featuring the messenger punching and kicking pedestrians is amusing at first, but it quickly becomes a nuisance. Between hassling with the bicycle, the agitated citizens, and the traffic that seems to exist just to piss you off, it's no wonder that all those cyclists in San Francisco protested recently. Imagine if they had played this game as well!
Rating: ★

Fighting Force
Publisher: **Eidos**
Developer: **Core Design**

After the huge success of *Tomb Raider*, everyone is waiting to see what Core

and Eidos do next. Sure, the sequel to *Tomb Raider* is incredible, but can they produce another dynamic and unique title? *Fighting Force* is their first chance to prove that *Tomb Raider* was no fluke. *Fighting Force* is the first true 3D *Final Fight*-type game, and while the 3D engine is incredibly smooth, in the end the game really offers nothing new to the genre.

The main goal when bringing any traditionally 2D genre into the third dimension is to retain the playability and control of the 2D games. In this case Core succeeds admirably. In fact, the control is so similar to a 2D game that it's easy to forget that the game is 3D.

However, while the seamless control is brilliant, the rest of *Fighting Force* is nothing more than a copy of other games of its type. The same barrage of mindless enemies is followed by familiar boss characters. To be certain, the backgrounds are very interactive, but items like baseball bats, guns, and crowbars have been a part of these games since the very beginning.

Fighting Force **is a decent enough time, it's just no better than** *Final Fight* **in 3D**

Even though each character has a huge variety of moves, the player ends up picking one or two moves and mashing the buttons the rest of the time.

However, despite its derivative nature, *Fighting Force* is a very fun game. Yet, it's just not the same huge leap forward for the *Final Fight* genre that we might have expected from the creators of *Tomb Raider.*
Rating: ★★★

Frogger
Publisher: **Hasbro Interactive**
Developer: **Millennium Interactive**

Like the one-hit wonders or past-their-prime rockers usually found touring fairground venues and small bars — The Eagles, The Guess Who, Jethro Tull — some classic arcade games refuse to die a dignified death. Instead, something that may have once been great for its time is reduced to tired mediocrity, self-parody, or worse. In the case of *Frogger*, this refusal to go away results in a vile spawn

of hell unleashed on the unsuspecting videogame masses.

Frogger starts out innocently enough with a few levels of the classic game format, freshened with very simplistic polygonal graphics. Although there's nothing that particularly stands out about the new look, the gameplay experience is faithful to the original, which allows nostalgia-blinded *Frogger* fans to gleefully exclaim, "Whee! I'm playing *Frogger*!" while more levelheaded gamers groan, "Whee. I'm playing *Frogger.*"

However, it's what comes after the old-style levels where the truly insidious nature of this undead monstrosity is revealed. The new interpretation of *Frogger* (which is the major portion of gameplay) features our wayward amphibian hero desperately seeking to navigate his way out of some of the most visually repulsive environments ever created for a videogame. If the game were just plain ugly, that almost would be forgivable, but the new levels are practically unnavigable at times

Frogger **proves it ain't easy being green, or this bad for that matter**

because there is no sense of depth and no map to indicate where you were or where you are supposed to go, and most infuriating of all, where you can and can't go without dying.

In the process of reviewing this game, an unlimited lives code was used, and this at least allowed some advancement through the levels. If this game were played with the allotted number of lives, it would literally be seconds before the game was over — and actually, in the final analysis, this quick end to the pain would be the only redeeming feature of this otherwise heinous game.
Rating: ★

Jet Moto 2
Publisher: **SCEA**
Developer: **Singletrac**

The original *Jet Moto* was a welcome change from the increasingly predictable car-based racers PlayStation was becoming flooded with about this time last year (a process that continues). With a

rating

PlayStation

physics model that was rooted firmly in the arcade, and a level of difficulty that had gamers scouring the Internet for the cheat to unlock all the tracks, *Jet Moto* proved you didn't have to have great graphics to be a great game.

With all the innovation that went into the first game (fictional jet craft, complex level design) and a full year to develop the sequel, one would expect *Jet Moto 2* to blow the pants off the original. Unfortunately, Singletrac has taken the safe road, merely remaking the first with relatively few, albeit helpful, tweaks. The handling on the motos has been tightened up, making control much easier overall. Also tweaked is the level of difficulty, which has been lowered, although the game is still quite challenging.

The level design, however, is not nearly as impressive as that of the first, if only because it's more of the same. Sure there are plenty of broken freeway sections over water, but we saw it all last time. Singletrac has even reused the suicide turnarounds that made up much

The level design in *Jet Moto 2* is hardly as innovative as the first

of the level design of the original.

But what's most distressing is that the graphics haven't been improved. Occasionally, it's difficult to make out where the track goes, and the foliage is as chunky as ever, only now it's actually on the track. With all the advances that have been made on PlayStation lately, it's inexcusable that *Jet Moto 2* should look like a first generation title.

Had Singletrac succeeded in making *Jet Moto 2* a brand new game with a look to reflect the year between titles, it would've deserved a higher score. As it is, it's just more of the same, with less innovation.

Rating: ★★★

NHL Breakaway '98
Publisher: **Acclaim**
Developer: **Sculptured Software**

The toughest sport for anyone new to enter into the fray has to be hockey. With veterans like EA, Virgin, and Sony putting out solid PlayStation hockey games, it's

an uphill battle for Acclaim in its attempt to jump in and make much of a dent. However, while the game doesn't stack up favorably to the other big guns, it is a very good game that offers some quality new ideas in the genre.

Breakaway has the deepest and most realistic strategy setup in the industry and includes season features that are likely to be in every other hockey game by next year. Throughout the season, players can collect points that can be used to heal injuries, train the players, and even upgrade stadiums, which makes *Breakaway* as much a resource management game as it is a hockey sim.

However, even with these impressive new features and a smooth 3D engine, *Breakaway* just misses on several counts. The graphics aren't as crisp as the others, and the play occurs at too frantic a pace. The speed is so intense that it takes away from the control and strategy by making the game a bit random. Often a goal will happen and no one realizes it until the players

Albeit a decent first effort from Acclaim, *NHL Breakaway* can't quite compete with the big guns

start to celebrate. That kind of thing indicates poor interaction and is the key reason *Breakaway* just doesn't cut it.

All in all, *Breakaway* is a solid hockey game that would've been the best a year ago. However, strong showings by all the major competitors make this one that can be missed.
Rating: ★★★

Red Asphalt
Publisher: **Interplay**
Developer: **Interplay**

Red Asphalt is a classic example of a game that was in development for too long. Announced more than two years ago, initially as a sequel to Interplay's interesting 16-bit combat racer *Rock 'n' Roll Racing*, the game is only now finding its way to the market. Unfortunately, this is about a year after it could have been considered somewhat fresh and appealing.

The problem with *Red Asphalt* isn't with anything technical. Although the graphics lean more towards the grainy

look of first generation PlayStation titles, the game boasts an admirable frame rate and is pretty much devoid of any serious draw-in problems. The visuals won't blow you away, but they're more than competent and look just fine. The music is slightly grating, thanks to the canned rock soundtrack, but otherwise the sound effects fill out the atmosphere of a combat racing game.

The problem with *Red Asphalt* is that it is so blatantly a *Wipeout* clone with wheels. Gameplay consists of racing around futuristic racetracks, picking up special weapons and power-ups while battling bad guys in heavily armed vehicles. Sound familiar? It should. A feature that allows the player to purchase new vehicles and upgrades adds some strategic depth, but even this feels generic and familiar. With more than two dozen tracks, there's plenty of gameplay value for die-hard fans of the genre, but the average gamer won't find anything to entice a thorough playing.

Is *Red Asphalt* a bad game? Definitely not. It's just that for a game like

Combat racing diehards might find enough in *Red Asphalt* to forgive its lack of originality

this, *Wipeout XL* is the definitive "must-play" example. Fact is, if you happened to miss out on playing *Red Asphalt*, you probably wouldn't care.
Rating: ★★

Steel Reign
Publisher: **SCEA**
Developer: **Sony Interactive**

It's sad to observe that games seem to have reached a certain plateau on PlayStation. Where the first generation of titles yielded a bumper crop of genre-busting games like *Jumping Flash!* and *Resident Evil*, each subsequent generation has gotten more and more lackluster. Sony's *Steel Reign* is a perfect example.

Very much an action title, *Steel Reign* puts players behind the wheel of prototype one-man tanks, designed for intense, close-range combat. The premise is as simple as it is overworn: Follow your orders and take out the specified target areas, acquiring a greater variety of weapons as you go. Yawn … snore … oh, sorry, where were we?

Big explosions and kills by the hundred do not a great game make — witness *Steel Reign*

Steel Reign may be a tank game, but this is no sim. Control is as simple as pointing in the direction you want to go. The turret does rotate independently of the body, but that is about as complex as it gets.

This simplicity in gameplay may seem attractive at first — all guns and no brains — but it ultimately begins to wear thin. Driving up to a clutch of tanks and blasting away, no matter whether you're in the desert or in a city, is only so satisfying. Add to this a tendency for the camera to jerk around, as well as the occasional sloppy glitch, and *Steel Reign* loses some of its appeal.

Had *Steel Reign* been released at the same time as *Warhawk*, it may have seemed more impressive. As it is, it's just another action title with lots of guns and explosions.
Rating: ★★

Test Drive 4
Publisher: **Accolade**
Developer: **Pitbull Syndicate**

Electronic Arts' *Need for Speed* series confounded everyone at **Next Generation** by being extremely mediocre and still selling bucketloads. Accolade, hoping to catch the same kind of success, has taken EA's blueprints and copied them extremely well, resulting in a game that's just as lackluster and poor as both *Need for Speed* games combined.

The most impressive thing about *Test Drive 4* has to be the cars. From modern-day, high-performance cars like the Dodge Viper to classics like the 1966 Shelby Cobra, the game should be a veritable car collector's dream come true. However, the actual presentation of the vehicles in the game is a different story. Like *Need for Speed*, the cars that players actually race are much less spectacular looking than the one picked from the car select screen.

The definition of the cars is extremely poor — the stripes on the Shelby aren't even straight — but the handling is even worse. Steering is

PlayStation

much too tight, making turning at high speeds a difficult task at best, and braking only succeeds in running the driver into the wall. In a ludicrous quirk, it's actually better to take the wall at full speed, since the cars don't take damage, and if the brake isn't used, the car won't spin out.

Although the linear course design may have seemed like a fresh idea (everyone loves a road trip), the execution is marred by strategically placed obstacles in the form of both

Test Drive 4 **has too many road hazards and not enough driving**

oncoming and cross traffic, as well as cars entering the roadway. The initial challenge of these hazards wears thin when the steering won't allow them to be avoided. Getting caught by a police car will also slow you to a stop.

Had developer Pitbull done away with the hazards and just stuck to the driving, *Test Drive 4* might have been a decent racer. As it stands, it's just another *Need for Speed*. And nobody needs that, not even EA.
Rating: ★★

Saturn

Silhouette Mirage
Publisher: **ESP**
Developer: **Treasure**

Treasure may never venture into the realm of polygons and texture maps, but that's all right. It's one of the few companies that continues to innovate in a genre that is increasingly dated. In creating *Silhouette Mirage*, the Treasure designers demonstrate a mastery of 2D action bordering on the sublime, accomplishing more on a flat plane than most do with a three coordinate system.

The game plays upon the conventions of two-dimensional games, taking the absolute dichotomy of left and right to extremes. The world of *Silhouette Mirage* splits a future Earth into creatures of silhouettes and mirages. Silhouettes can be killed only from the right, while mirages are only vulnerable from the left. As a result, players must think on-the-fly and adopt patterns based on tactics instead of reflex.

Each level is smartly designed, forcing players to use a variety of

This guided laser comes close to destroying the gameplay balance of *Silhouette Mirage*

weapons and moves in less obvious ways. Shields not only protect the characters from harm, but can also reflect enemy fire back to the source, while hand-to-hand combat also serves to shake down enemies for cash as well as damage. The way Treasure blends multiple objectives into each situation is nearly seamless.

Unfortunately, some power-ups unbalance the game's design. In particular, the locking laser, which is a standard weapon, gives an unfair advantage to the player so that little skill is necessary to take down a majority of enemies. It remains highly entertaining, but it becomes little more than a really good shooter.

In the end, *Silhouette Mirage* is a game that succeeds because of good gameplay. Any shortcomings come from Treasure's tendency towards too much rather than any deficiencies of the genre. Like Capcom, Treasure has chosen, for the moment, to continue with 2D games and continues to exceed expectations.
Rating: ★★★

Saturn

Still kicking

Tecmo's first fighting game is surprisingly polished

Dead or Alive
Publisher: **Tecmo**
Developer: **Tecmo**

When *Dead or Alive* came out in the arcades, it did fairly well financially. Unfortunately, it got labeled as a *Virtua Fighter 2* clone with bobbing breasts (and *man* do they bounce — there's even an entry on the Options screen to turn this on and off. No telling whether this will remain in the U.S. version). It then got lost among the horde of 3D fighters that came out last year. However, a recent Saturn conversion has given it new life in the console market. In fact, *Dead or Alive* may arguably be the best brawler since *Fighter's Megamix*, and certainly the best seen on Saturn for a long, long time.

While games like *Tobal No. 2* have improved on the movement modes for fighters, the actual conflict still consists of one player attacking while the other blocks or attempts to break the combo. There's still a perceptible transition from offense to defense. However, Tecmo's fighter uses a brilliant modification of the *Virtua Fighter* system to blur the line.

Dead or Alive still uses the three-button system pioneered by *Virtua Fighter*, but it replaces the block button with a hold function, which enables players to catch punches and kicks, and in return execute combos of their own. A master of the hold button can time it so he or she

Dead or Alive **represents near-flawless programming, making a good arcade game so much better on Saturn**

slips out of throws and combos like a Teflon-coated top while simultaneously attacking the opponent. Knowing fighters' strengths and using opponents' strengths against them are equally important. As a result, a match becomes a matter of push and pull rather than offense and defense.

Technically, it's as accomplished a Saturn game as anything Sega has done. In many ways, Tecmo's programming has surpassed the efforts of the AM2 programmers who ported *Virtua Fighter 2*. The characters and arenas have been rendered in 60fps rock-solid resolution, with seamless backgrounds and clear sound. Control is precise and fast, even more so than in some of Sega's most recent fighters. Only the lack of 3D movement dates *Dead or Alive* to the pre-*VF3* era.

Dead or Alive is such a polished game that it's surprising to realize this is Tecmo's first 3D fighter. When it hits the U.S. in January, this may well be the title that keeps Saturn alive for a few more months, not *Last Bronx*.
Rating: ★★★★

The base character designs may not be as interesting as the *Tekken* fighters, but unlocking the game's numerous secrets makes the end product so much more interesting

PC

Nobly advanced

The master strategist of PC gaming shows us all once again how it's done

Most effective unit:
151st Penn Regt. (Biddle)

Even though the battles get hectic, control remains easy to use. The Union army holds the high ground and will most likely win this skirmish (far left)

Sid Meier's Gettysburg
Publisher: **Electronic Arts**
Developer: **Firaxis**

Sid Meier has once again lived up to his considerable reputation in Firaxis' new Civil War strategy sim Gettysburg. In contrast to the usually stiff, overly complicated gameplay associated with this genre, Meier's new title plays well enough to stand shoulder to shoulder with the best action/strategy games in the market.

The key factor that makes this game both easy to learn and highly realistic is an intuitive control interface. This simple design conceals a staggering amount of detail, yet still allows players to focus on the finer aspects of tactical strategy. Battles are determined by careful planning and precise execution rather than sheer brute force.

During a battle, players can command individual units in every possible, nitpicky way imaginable. From the standard interface, any movement, formation, or maneuver a unit can attempt is only a click away. Because of this, battles take on a calculated, tactical feel rather than the usual frantic chaos found in realtime strategy games.

The computer AI is another feature that makes this title so noteworthy. Opposing forces follow a more complex pattern than the usual realtime strategy foe and react to changing strategies in a realistic and often deadly manner. These enemies attack wisely, regroup, and flank, making their actions nearly impossible to predict.

Meier included hundreds of little details that add to both the historical accuracy and the realism of this title. For instance, each scenario is based on an actual conflict in the Battle of Gettysburg, and each unit's strength is based on its real-life counterpart. Also, after long battles, the fields are covered with the bodies of dead warriors, a grim reminder of this country's bloody past.

One of the few problems players will encounter in this title is a clunky scrolling mechanism that hides all the environmental graphics when moving across the screen. This allows players to quickly locate units, but it also causes a serious distraction when players only want to move the screen a short distance. Also, it's difficult to determine high and low ground with this graphics engine, a detail that becomes very important in artillery battles.

However, even with these minor problems, Gettysburg is an excellent first offering from Firaxis. It not only overshadows previous historical sims, but it also bests most of the realtime strategy games available today.
Rating: ★★★★★

PC

Age of Empires
Publisher: **Microsoft**
Developer: **Ensemble Studios**

Having been in development for nearly an eternity, Age of Empires has largely delivered what was promised by Civilization co-creator, Bruce Shelley, and his team at Ensemble Studios. With a strong emphasis on resource management, Age of Empires allows players to bring their civilization from the Stone Age up to the Post Iron Age.

As a single-player game, there are a number of campaigns and skirmish modes to keep a player busy for hours. The tutorial campaigns are easy enough to get used to, but anyone who has spent any time with WarCraft 2 will find the interface simple enough. Multiplayer modes via LAN and Microsoft's Internet Gaming Zone will pick up where the single-player modes leave off.

The game can be played in a military fashion or in an economic/diplomatic

Age of Empires has its quirks and flaws, but it also has satisfying, strategic gameplay

fashion. Tributes can be paid to rival civilizations to convince them to ally with you (or at least grant you a stay of execution). Trade boats allow players to gather gold through trading of other resources they may have a surplus of.

The military side of the game is very straightforward and has drawn obvious influence from Blizzard's WarCraft 2 in terms of unit creation. Computer AI is generally quite good and does offer an exceptional level of challenge. When playing in a game with multiple computer opponents, each CPU player is actually separate from the others. It is possible to play them off one another, and it's not at all unusual for CPU players to eliminate one another.

While Age of Empires will satisfy nearly every strategy fan, there are a few flaws in the game that could have been improved. The lack of queued production is certainly a major drawback to the game's flow. Also, the game uses a pretty shoddy pathfinding algorithm that sometimes leaves units stuck off by themselves somewhere. While minor, these small problems keep the game from getting five stars, but not by much.
Rating: ★★★★

Dark Earth
Publisher: **MicroProse**
Developer: **Kalisto**

Like the console RPG, graphic adventures on the PC are rapidly approaching the flat end of the development curve. With the exception of the full-motion or Myst-

PC

type game, most adventure games have followed the SCUMM or *King's Quest* interface and have been saddled with the appropriate benefits and limitations as a result. Kalisto's *Dark Earth* is one of the finest members of the *King's Quest* legacy and is a solid game with too much potential left untapped.

An adventure's worth is in the story, and *Dark Earth's* is impressively thought-out and deep. Kalisto's designers were very careful to create an internally consistent world, from history to environment. Thus, the milieu of the Stallite Dhominyon is rich in detail without resorting to needless exposition.

***Dark Earth* is a fine graphic adventure, but it's just a graphic adventure like many others**

The character voice acting is quite good, and the situations are more mature, feeling natural without being too cheesy.

The technology of the game can't keep pace with the story, unfortunately. Like *Resident Evil*, the action takes place with three-dimensional characters in flat, prerendered screens. Sure it makes for pretty pictures, but picking up objects or recognizing interactive objects becomes problematic depending on the camera angle.

Even worse, a clunky, frustrating combat system almost destroys the game's attraction. Minimal control with multiple attacks proves frustrating, making most victories the product of luck rather than skill.

Dark Earth is one of the better graphic adventures, but the genre itself is getting stale, and this game can't help but to reflect that.
Rating: ★★★

Excalibur 2055 A.D.
Publisher: **Sir Tech**
Developer: **Tempest**

In designing *Excalibur 2055 A.D.*, Tempest designers should have remembered that there is a difference between classic gameplay and old gameplay. Classics can be reworked to fit today's technology, but the obsolete still look and feel primitive, in spite of gaudy window dressing.

Although it's been labeled "A *Tomb Raider* with swords," this game is

nothing of the sort. Players are subjected to the most dilapidated of premises — the dungeon explorer. In theory, the character is supposed to travel through a living, breathing world, and to Tempest's credit, some effort was made to create characters and environments like sewers and living quarters. Unfortunately, the level design is rather primitive, with maps that smack of mid-'80s RPGs: simple, angular, and linear.

None of this would be so bad if *Excalibur* was a shareware game. The fact that it touts its 3D nature with 3Dfx and DirectX compatibility, however, turns

***Excalibur 2055* just can't compete — despite the 3D environment, it looks like it's five years old**

it into a mortal sin. There are detailed rooms where the borders are totally inaccessible. Holes in the wall hint at secret passageways, but the only movement allowed is in the four measly cardinal directions. Making a polygonal world just screams interactivity, but this future world feels like a painting, and a bad one at that.
Rating: ★★

Lands of Lore: Guardians of Destiny
Publisher: **Westwood Studios**
Developer: **Westwood Studios**

The development cycle of *Lands of Lore: Guardians of Destiny* was a curious one. The follow-up to Westwood's hit role-playing game was going to be an adventure game, running along the lines of (shudder) *Myst*. However, that plan was scrapped as the point-and-click adventure lost popularity and the burgeoning role-playing genre once again grew in public favor. The 3D engine got fitted with some role-playing elements like a larger inventory system and stat growth, and this makes for some interesting gameplay. Not all of the static adventure screens were taken out — players will encounter them in various parts of the game at special locations, along with the rendered *7th Guest*-like video moments. For the most part, though, the game is experienced through a first-person, realtime 3D engine. The graphics aren't anything to

write home about — the pixelation is particularly horrendous — however, a 3D accelerator patch is in the works and should fix these problems nicely.

After learning the quirks of the controls (it takes a while to find a method of movement that feels natural and comfortable), players will discover a game rich in depth, from character interaction to weapons and combat spells. In terms of being a role-playing game, it's not very close to the mark. Players begin with a premade character (Luther, inadvertently cursed by his mother Scotia, the nemesis of the first game) and can't really see any of his
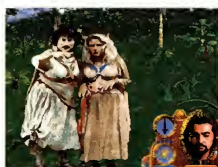
***Lands of Lore* is a worthy sequel, but it's also something of a game mutt — part RPG, part adventure**

skills, although meters indicate his current level at fighting and magic. Luther grows and interacts with characters in the world based on his actions, with many a noticeable pause during conversations while the program figures out what the players have done and how the characters should react.

This game definitely has a more adventure-esque feel to it, so if you're looking for a true role-playing title, this isn't it. However, the adventure is a compelling one. The Full Motion Video tells a dramatic story over four CDs. Unfortunately, the acting is barely tolerable, and the one-liners Luther delivers throughout the game get annoying rather quickly. It has a lot to see and do, and some rather clever puzzles. It's more along the lines of *Realms of the Haunting* than *Daggerfall*, but that's certainly not a bad thing. It might mean that the story is linear, but there are many puzzles to solve, lots of inventory items to find, and with its item combination system, players can experiment for hours making new items. The adventure may have its quirks, but if you have the patience to play past its faults, it's an entertaining romp.
**Rating: ★★★**

Mageslayer
Publisher: **GT Interactive**
Developer: **Raven**

Mageslayer could best be summed up as *Hexen 2* from a top-down

perspective. There are four different characters: earthlord, warlock, inquisitor, and archdemon. Each of them has its own attacks, spells, and artifacts it can use, although it seems like all attacks involve some form of projectiles.

What stands out most is the game's level design, which takes maximum advantage of the multiple elevations provided within the scope of the 3D engine. Like *Hexen*, there are five worlds joined by a central hub. Each world contains a boss that possesses one piece of an ancient relic (which is needed before the final boss
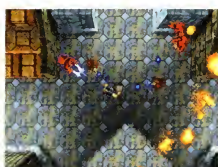
***Mageslayer* is almost like *Diablo* or *Hexen* seen from the top down. Not bad though**

can be destroyed). The worlds themselves are extremely varied, and no two of them look alike. Switches and teleporters provide the bulk of the puzzle solving, since the major focus of the game is action.

Graphically, the game is somewhat disappointing in the standard software rendering modes, mostly thanks to its low-resolution display. Support of accelerators through Direct3D largely removes this gripe by providing higher resolutions, better texture quality, and a boosted frame rate. And 3Dfx owners will see even better improvements through the use of the Glide-supported video modes.

Typical of past Raven projects, the sound effects of the game are well-conceived and make excellent use of stereo separation. Screaming rats, the explosions of lightning bolts, and other sounds are clean and don't suffer from compression artifacts. About the only failing of the game seems to be with slightly subpar AI. Enemies rely upon gang attacks and flanking, generally rushing headlong into any defenses the player may have set up.

Overall, the game's action, level design, and multiplayer modes (which include a Capture the Relic team option) make this game stand out from most other shooters on the block. For those players who possess the benefit of 3D acceleration, this title could be quite a nice one to showcase your shiny new hardware.
Rating: ★★★★

PC

Rebel with cause

A highly anticipated genre-buster keeps
all of its promises

Uprising
Publisher: **Cyclone Studios**
Developer: **Cyclone Studios**

E ver since it released the top-rated *BattleSport*, a combination of tank warfare and hockey that was both 3DO's finest hour and its swan song, Cyclone Studios has carved a niche for itself as a developer with a knack for innovative ideas and cutting-edge technology. *Uprising* is another genre-blending title, this time combining first-person shooters with realtime strategy, doing so with such natural aplomb that it makes you wonder why it hasn't been done before.

As a rebel commander facing down an evil empire, players pilot the Wraith, a ridiculously heavily armed prototype hovertank that is dropped onto Imperial-controlled planets in hopes of liberating them. Certain points on the map, known as Citadels, are suited to the mining of power and the construction of factories. Capturing, controlling, and holding Citadels is the main strategic motivation behind the action. The idea is to use Citadels to build troops, armored vehicles, attack aircraft, and other hardware; drive to an Imperial-held area; and teleport rebel forces into combat, then use the Wraith to support the action.

The Wraith's selection of weapons, which can be upgraded over time, shows a lot of imagination and visual flair, from the swarming Hive Missile System to the Mole Torpedo, which tunnels underground, leaving a trail like the gopher in *Caddyshack*. The graphics are excellent, with z-buffered explosions and fire, nary a

polygon out of place, and some cool lighting effects. It supports 3Dfx's Glide API directly, and those with 3Dfx-based accelerators can expect a high-resolution, high-frame-rate experience that has to be seen firsthand. The draw-in horizon is a bit close, but with so much going on at once, it's hardly noticeable and makes little difference.

Indeed, the pace of this game is insane, and players have to be mighty fast on their feet to keep up. The strategy element isn't a gimmick, and without careful planning and deployment of resources, no amount of pinpoint accuracy or Wraith firepower can carry the day. In fact, if there's one complaint that can be made about this game, it's that the level of difficulty is insane as well. The missions quickly ramp up to the point where the player can expect a number of serious kickings before a hard-earned victory. Oddly though, far from proving frustrating or repetitive, this doesn't affect the game's addictive quality at all. Everyone at **Next Generation**
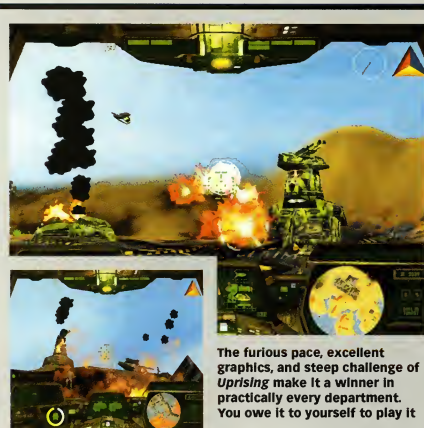
The furious pace, excellent graphics, and steep challenge of *Uprising* make it a winner in practically every department. You owe it to yourself to play it

seemed happy to keep coming back, no matter how crushing the defeat.

In addition to the variety found in the single-player campaign, the game supports up to four players over the Internet or a LAN — not as many as some, but given the amount of action in a typical session, probably more than enough. This is groundbreaking gaming at its best: fast, challenging, and beautiful. It's absolutely way beyond recommended.
Rating: ★★★★★

PC

Pax Imperia: Eminent Domain
Publisher: **T*HQ**
Developer: **Heliotrope Studios**

T*HQ's first PC offering is a sad one indeed. In a market already saturated with numerous *Master of Orion* clones, it would take a serious advancement of or difference in gameplay to even be noticed among the zillion "me-too" titles. *Pax Imperia: Eminent Domain* attempts to create something new and different but ends up becoming just another lackluster entry.

The only innovation that sets *Pax Imperia* apart from the rest of the pack

***Pax Imperia* is just too confusing, too poorly laid out, and too derivitive to recommend**

is its realtime engine. The game allows all players to build, attack, and move ships on-the-fly without having to wait a turn. This is a welcome addition to the subgenre, and it will probably be adopted by future games of the type.

However, *Pax Imperia's* interface and building tree can be frustrating at times. The display graphics and control button graphics meld together so well that it actually makes it impossible to tell what is clickable and what isn't. The utter lack of intuitive controls and the inclusion of outrageous techno-babble make it difficult for even the most experienced player to grasp what's going on in the game much of the time. In other words, expect to spend way too much time frantically flipping through the manual with one hand while searching for the right panel button with the other hand.

The original *Pax Imperia* offered complexity and elegance, but this one is too arbitrary and confusing. Having lots of competing species is great, but why does a race of hive-minded bugs need spies? Or emissaries? Or a technology tree? Overall, this game has the feel of a project that was in development for far too long, and suffered from feature crawl as the rest of the industry passed

by it. We're confident that Heliotrope can do good work in this genre. Now that it has this out of its system, maybe we'll see good things next time.
Rating: ★★

Postal
Publisher: **Ripcord**
Developer: **Running with Scissors**

Sometimes a gimmick is enough for a videogame to get noticed. In the case of *Postal*, that gimmick is pure, bloody violence. While this game will draw attention (and flack from parent groups)
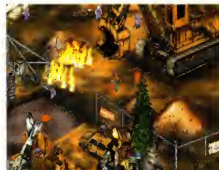
Violent as can be and surprisingly fun, *Postal* is worth checking out

because of its blood-stained action, its gameplay and graphic design make it definitely worth checking out in any case. *Postal* plays more like a first-person title than an overhead arcade shooter. Players are dropped into danger-filled environments and are required to blow up anything that gets in the way, including harmless civilians.

The control modes should be familiar to fans of first-person shooters, which works in the game's favor. At first, most players will attempt to run straight into the fray and fight the enemies at close quarters, but quickly they will learn that a healthy dose of strategy underlies the overall twitch nature of the game. After a while, players will utilize the same strategies they've perfected in first-person games, setting enemies up for safe and easy shots.

While the gameplay ensures that *Postal* is enjoyable, the design behind it is actually just as strong. Instead of modeling the levels in polygons, the developers used hand-painted backgrounds that give this title a distinctive look. However, while easy to appreciate, at times the artistic design causes problems for the gameplay.

Large objects like buildings and trees often block the view of enemies and power-ups. This is not a problem if a bad guy is merely hiding out, but when players are side-by-side with an enemy, they should be able to see their opponent.

Finally, while most of the voice samples are well-done, the other sound effects are less than spectacular. The game sounds tend to become repetitive after a while and are not realistic.

Overall, Postal is a title that breaks absolutely no new ground, but its tongue-in-cheek shooting action comes together to form a well-above-average shooter that adds to the genre.
Rating: ★★★★

Sub Culture
Publisher: **Ubi Soft**
Developer: **Criterion**

The exploratory nature of the gameplay in Sub Culture actually draws comparisons to a couple of similarly themed console games: Treasures of the Deep and Aquanaut's Holiday. A superficial comparison could label Sub Culture as "Treasures of the Deep with more depth" or as "Aquanaut's Holiday with a purpose," but that perhaps would be selling the game short.

A realistic and beautiful undersea environment sets the stage for Sub Culture's superior gameplay

In terms of gameplay, Sub Culture also excels, with a satisfying mixture of exploration and mission-based objectives. There are about 30 different missions in the game, ranging from pollution prevention to treasure hunting to hostage rescuing. All of the missions take place within the larger context of a civil war between feuding undersea tribes and the threat of rampant pollution to the game's underwater world. The whole scenario ties in with an "earn money so you can buy upgrades to save the world" format that adds a considerable amount of strategy and depth to the game.

The game supports just about every 3D accelerator board available, and the resulting undersea world is a visual delight. Even without hardware enhancement, Sub Culture creates an immersive environment that clearly surpasses previous efforts for this type of game.

Sub Culture's only real flaws are the artificial nature of the boundaries of its 3D environment and the lack of a multiplayer game. The boundaries complaint is one that is understandably inherent to many 3D games, but the problem is even more noticeable and annoying in an underwater game where the player isn't even allowed to surface, and huge mountains inexplicably rise up to prevent navigation off the game map. As for the multiplayer aspect, even a simple deathmatch scenario with heavily armed subs would have been welcome. Also, the sound effects can't quite match those of Treasures.

All in all, Sub Culture creates a compelling world, and if the thought of undersea exploration and adventure appeals to you, this game is probably the best of its kind.
Rating: ★★★★

Caveat

Origin moves forward with a bold experiment and pushes online gaming to new heights — with new pitfalls

Ultima Online
Publisher: **Origin**
Developer: **Origin**

The concept of continuous, multiplayer environments has been around for some time, but actually carrying it out on any scale has been a new area for computer gaming. And no game has been as highly anticipated as Ultima Online. Based in Brittania, the fantasy world created more than a decade and a half ago by Richard Garriott, Ultima Online certainly has enough depth of background to draw upon, an already established fan base, and the seemingly unlimited resources of Origin. Conventional wisdom was that if any online world would get it right, this would be the one.

So, it's finally here. Has it succeeded? Well, in a very real sense, it depends on what you mean by "success" and whom you talk to (and for the record, we talked to a number of other players). The designers at Origin have certainly created an impressive world to run loose in. Just in terms of sheer size, Brittania is unmatched in the online universe — and takes up a whopping 276MB on the hard drive to prove it. The isometric, third-person view appears tile-based, and there's a fair amount of repetition, but also surprising visual variety across the many islands in the Ultima archipelago.

Latency is still a bit of a problem, and lags are noticeable and occur fairly often. But the prevailing attitude among players is that the initial annoyance quickly fades into mere acceptance, and people just get on with their virtual lives. The pricing structure (after the relatively steep CD-ROM purchase, of course) of one month free and $9.95 a month thereafter seems reasonable. Combat is straightforward, and Origin falls all over itself promising that there will be no "lag deaths."

Within this world is an active ecology, a relatively realistic economic system, and a social niche for almost any taste. Tinker, tailor, beggerman, thief — they're all there, both as nonplayer characters and as potential professions for players. Why exactly anyone would want to pay $9.95 a month just to play a virtual baker is beyond us, but it's entirely possible.

Which brings us to the first pitfall: Everyone wants to be a hero, almost nobody wants to be peasant fodder. However, for most, building a character into a hero can mean days, maybe weeks of diligent work, performing less-than-spectacular feats of derring-do. There is the ever-popular "Bunnybane" model, where players kill hundreds of tiny animals in the forest to build up combat stats while selling meat and fur for cash to buy equipment.

The latest wisdom as of this writing is to "be a smith," on the theory that being a weapons manufacturer is a lucrative profession, and a week or two of slaving over a hot forge will allow prospective adventurers to outfit themselves nicely. However, any chosen career path still means that at least some period of time is required for performing relative drudgery before there's any prayer of slaying a dragon. For many, this should be fine, as the rewards — respect and fame — are potentially satisfying enough to be worthwhile. The more cynical might suggest that "one month free" is just

The streets of Brittania are often crowded, and the knowledge that these are all live players is both exciting and daunting

time enough for things to begin to get interesting, thus ensuring a community of fired-up, paying adventurers.

The exception to this is finding someone, or a group of someones, who will provide assistance, and here's the most interesting aspect of Ultima Online — the social dynamics that will continue to evolve in a fantasy world populated by several thousand characters with very real brains behind them. One's particular experience with Ultima Online is framed in a large part by the group one chooses to play with, or happens to meet. It's exciting and wonderful in a way few things in computer gaming are, but this kind of functional anarchy can also be unpredictable and infuriating. What you bring to the community and what you expect out of it are just as important to the experience as anything else.

In the end, Ultima Online practically defies critical analysis because everyone's experience will be different. Add to this that the team at Origin is still working out and fixing both gameplay issues and game content, and you've got one slippery beast indeed. Therefore, we can only answer right now, as this is being written, questions of how great the potential for having a good time is.
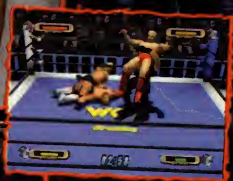
The answer, thankfully, is quite a lot. Sure there are a fair number of annoyances, both large and small, and the system is far from perfect. However, it's a very big world in there, full of lots of exciting things to try and accomplish, with more to be added over time and lots of real people around to know you did them. Brittania is what you make of it. Have fun.
Rating: ★★★★

The world is what you make of it, once you've slaved away to build up a character, of course

Online

Meridian 59: Revelation
Publisher: **3DO**
Developer: **3DO**

While *Ultima Online* has been grabbing all the recent headlines, *Meridian 59* has been up and running now for more than a year, and *Revelation* is this online world's latest update/revamp. *Meridian 59* uses a first-person perspective, which some may find more intuitive and inviting. Also

Take a good look, because killing spiders is about all a character in *Meridian 59* can do for a while

appealing to many may be the fact that newbies to *Meridian* are simply invincible to other players until they reach a certain level.

Once again, the overall experience depends on who you wind up playing with, but *Meridian 59* has a few things going against it. For one, the billing model is a bit off-putting: Although it's only $2.49 per 24 hours total time online, and free sessions can be easily earned, it still turns eager players into clock-watchers.

Also, *Meridian* uses multiple servers, each with its own identical model of the game world, and each serving a few hundred players with no crossover. A player on server 101 will never meet any of the players on server 102. The designers claim that most people can only really get to know, in a meaningful sense, a few hundred players anyway, and this keeps things more intimate.

However, the simple fact is that the world of *Meridian* isn't really that large to begin with — plunking down several thousand characters into this small plot of virtual real estate would

quickly make it look like Times Square during New Year's Eve. Limited room to move also means a limited list of things to do, and crisscrossing the same areas over and over gets dull fast. The list of skills and spells is likewise modest, and many small vermin must be destroyed before a player is strong enough to try something serious.

There is a new island locale in *Revelation*, Ko'catan, which expands the world's size and the activities found within by 50% — it's still relatively modest, but it's bigger and arguably better. The engine has been tweaked, and bugs fixed. Advancement is easier, so fewer rats and spiders need to die to pump up a player's skills. And the process is continuing, since 3DO has even bigger plans for the future. *Meridian 59*'s next planned iteration is *Renaissance*, due later this year — all this before it finally becomes morphed into Might and Magic Online next year (since 3DO now owns New World Computing).

As it stands now, however, it's no better than second-best in its field.
Rating: ★★★

Macintosh

Evolutionary

Galapagos
Publisher: **Electronic Arts**
Developer: **Anark**

The Artificial Life race heats up

T raditionally it's required a lot of horsepower and knowledge to study it, but for the first time a company named Anark has distilled the Artificial Life experiment into a pregenerated world called Galapagos and a small arthropod named Mendel, running just fine on either PC or Mac. Unlike the Norns of CyberLife's *Creatures*, Mendel is a true artificial life-form, rather than an artificial species. To the programmers' credit, Mendel feels like a real life form. It constantly learns, which means its behavior isn't always predictable. Even opening a saved game does not guarantee that Mendel will always turn right towards the platform instead of left into the rotating laser beam.

Artificial Life doesn't necessarily make a good game, however. Thankfully, a strong 3D engine and solid puzzles do. The levels are straightforward, yet beautiful, and they give players ample opportunity to explore. Unfortunately, the designs can also be abstract to the extreme, so players might not know if the tile on the floor doesn't move because it's not designed to, or if the cursor just hasn't hit the right hotspot.

The most frustrating and rewarding part of the game is trying to figure out what's going on in Mendel's pointed head and figuring out how to alter or encourage the new behavior it's learned. At its best, Mendel will become, after days of work, an equal partner in solving puzzles. At its worst, it devolves into little more than a crab, scuttling to avoid the player's cavemanlike jabs of the cursor. Enjoying *Galapagos* requires time, patience, and imagination. Otherwise, it might be easier to stick to games that never access anything higher than the spinal cord.
Rating: ★★★★
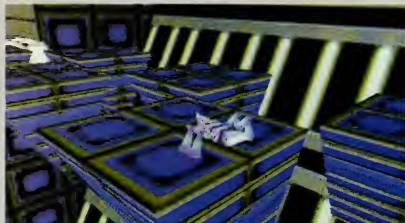
The rudimentary puzzles become more intriguing as players try to get Mendel to solve them

Macintosh

Close Combat: A Bridge Too Far
Publisher: **Microsoft**
Developer: **Atomic Games**

Close Combat: A Bridge Too Far is Microsoft and Atomic Games' latest offering to desktop generals everywhere, and the sequel to last year's *Close Combat*. A PC/Mac hybrid release, *A Bridge Too Far* is a realistic, realtime strategy game built around actual battles from World War II. The realistic nature of *Close Combat* includes the actual geography of historic battles and an AI equivalent of shell shock that sends panicked soldiers running.

This sequel improves upon most of the problems that earned the original a low two-star rating. Squad psychology still throws off strategy, but at least soldiers aren't as likely to panic for less than apparent reasons.

Customized settings can eliminate psychology completely, creating fearless squads of jack-booted thugs or liberating GIs. Individual units are still difficult to pick out amongst trees and ground cover, but new bounding boxes and the option of removing the tops of trees (for a late November feeling) make unit identification easier. A host of small interface tweaks improve the experience as well.

Allied armor and troops storm a victory location in *Close Combat: A Bridge Too Far*

Players can choose to engage in a huge variety of single missions or one of several campaigns that cover specific geographic regions, based closely on the actual landscapes in France. For the Eisenhowers among us, there is the Grand Campaign that covers the entire front. Although mainly a single-player game, *Close Combat: A Bridge Too Far* has a token two-player mode that can be played for free over Microsoft's Internet Gaming Zone.

Although not a perfect game, *Close Combat: A Bridge Too Far* fills the gap between the classic WWII strategy of titles like *V for Victory* and the current *Command & Conquer* knockoffs. If replaying historic battles appeals to you, *A Bridge Too Far* is the game to play.
Rating: ★★★

Listen to yourself. Satisfy your desire to communicate and let the rest of the gaming world know what *you* think. Write us at **Next Generation** Letters, 150 North Hill Drive, Brisbane, CA 94005. Fax us: (415) 468-4686. Email us: ngonline@imagine-inc.com.

letters

Your chance to write our wrongs

I just read issue 35 and I'd have to say it was one of your better issues. I liked the 25 breakthrough games article, but I'm not sure *Quake 2* should have been on the list. Come on, what does it really do differently for that specific genre?

William
email withheld

John Carmack has always been two steps ahead of everyone else when it comes to engines — the sheer number of games coming that use the *Quake* engine proves that — and *Quake 2* does not look as if it will change that trend. *Quake 2* won't just influence many future titles, it will be at the heart of many future titles, and the technologies that Id embraces are intensely scrutinized by its competitors.

I n the November issue, *Total Annihilation* is not mentioned as a breakthrough game when in fact it is the first 3D realtime strategy game in history. Yet *StarCraft*, which isn't

even out yet, is said to bring realtime strategy to a new level! *StarCraft* is going to be more of the same old 2D sprite games! I have been hearing many bad things about **Next Generation** misrepresenting games and giving them reviews they don't deserve.

whir@concentric.net

(Note: This represents one of the dozens of emails we got on this subject.) *Total Annihilation* is a great game (it received four stars in our December issue), and the addition of 3D landscapes is an evolutionary change. But the game, while excellent fun to play, isn't amazingly different from *C&C* or *WarCraft* — there are still two armies with relatively similar units fighting each other. Yes, *StarCraft* will be 2D, but it will feature three races with vastly disparate skills and units. If Blizzard can pull it off and make the gameplay work (and its past work indicates that it has a very good chance), we think that *StarCraft* will ultimately be a

greater advancement to the genre, adding more replay value and more depth. As for the comment that *StarCraft* isn't out yet, see our next response.

I can't believe you guys! I was reading **NG 35** the other day, and I found out that you didn't add *Final Fantasy VII* as one of the 25 breakthrough games or even think about adding it to the list. It's the best game ever! Almost everyone knows that! The graphics are smooth and the gameplay is cool. The FMVs are awesome and the storyline is also very good. Why didn't you add it in the 25 breakthrough games?

Brian Lau
Jag251@bigfoot.com

Because it was already out. The story was on forthcoming games to watch for, not games that had been released already.

I was just reading your **NG 35** and noticed all the ads for companies wanting to hire programmers, graphic artists, etc. Well, I would really really love to do something like this, and I am currently pursuing a degree in computer science. I have read all the ads and they all require a B.A. in computer science — but they also require two years of experience. How does one get two years of experience when half of these companies don't offer co-op or anything like that? Just the burning question on my mind.

Shane Thomas
shathoma@nmsu.edu

The old foot-in-the-door problem rears its head again. The "can't get a job without experience, can't get experience without a

job" dilemma isn't unique to gaming, of course, but the game industry can be hard to get into. You may want to check out the story we did in **NG 16**, "How to get a job in the game industry" for hints.

W hat ever happened to the Crib Sheet? Or the Data Stream? Or my favorite, the sarcasm corner in the Letters section? These were the high-watermark elements of your magazine that set it infinite notches above the rest and made me laugh my ass off. In all honesty, they quite possibly made your magazine the best of all time.

Daniel Ryall Penton
penton2@hotmail.com

Thanks. For your benefit, we have three letters this month in the sarcasm corner. As for Crib Sheet and Data Stream, we've actually done one of each since our design revamp in July, but your comments (and the many similar ones we got on the subject) are noted. Look for both to make a permanent reappearance starting in February.

I remember at some point before the launch of N64, GameTek announced it would release *Robotech 64* for the system. When Nintendo demonstrated *Mario 64*, all the other game developers went back to the drawing boards to take advantage of the system's special effects. GameTek was one of those developers that had to retool its game. I want to know whether GameTek is still planning on releasing it because it has been a while and I still cannot find out anything about it.

Jacob Moran
castle-rock@juno.com

Can *Quake 2* justify its inclusion on our list of breakthrough games? Given John Carmack's reputation for good work, we think so

corresponding

StarCraft won't deliver the kind of graphics seen here in a rendered image from the game, but it should offer more than enough gameplay innovations to justify its inclusion on our list of 25 breakthrough games

According to Ocean (who acquired *Robotech 64* from GameTek, one of Nintendo's original "dream team"), the game is still coming out. When, of course, is anyone's guess — we haven't seen anything new on it in months.

I am extremely cheap and scheming. A few months ago, I talked my buddy Chuck (name changed to protect me) into purchasing a Sega Saturn. He's an impulse buyer and a spendthrift — he's not very bright either. A few days ago, I put a piece of scotch tape over the laser so the machine would malfunction. When Chuck and I sat down to play a game of *World Series '98*, the Saturn failed as planned. I offered to bring the machine to a repair shop for Chuck, like any "good buddy" would do. A few days later I notified Chuck that the "repair shop guy" said that the laser was blown, and it would be about $150 to fix it. Of course Chuck said he would rather buy a new Saturn. I then told him that the repair shop guy would give him $10 for the unit to use it for parts. (Looking back, I'm hitting myself for not saying $5.) Chuck agreed and the next day I paid him. Now I have a nice, almost new

Saturn for $10 and a little bit of bad karma. I'm delighted to say I'm encouraging Chuck to buy a PlayStation instead. I figure I can get all of his now useless Saturn games and acquire the PlayStation in a month or so. I guess I don't really have a question I just needed someone to tell. Oh, by the way, I don't in any way condone my actions. I'm just absurdly cheap and selfish, and I've been doing this kind of thing for years.
Jeffrey Lammers
jeff_lammers@juno.com

You know, Jeffrey, it's guys like you who make us wish we had daughters so we could forbid them from dating you. Have you ever considered a career in auto repair or aluminum siding sales?

Each month I eagerly await my next issue of your magazine, and each month, along with the good stuff comes a bunch of crap. How come in issue 35 you have a 30-PAGE AD FOR EB?? Are you guys getting paid for this or something?
Sevag Gharibian
900073@ican.net

Ah, Sevag. OK, let's just clear this up: Yes, in fact we do get

paid for the ad pages in the magazine, although the editors don't have anything to do with the ads or ad sales. We don't even know what ads are going to be in an issue till we see it.

I'm kind of curious why you "corrected" Jeff Rendl's code in the October issue's Letters page. The code as written is valid BASIC code, and your response seemed to imply you thought he was using incorrect syntax. On the other hand, it is possible that you recognized his code as BASIC, but you preferred C code for its performance gain from compilation. In that case, let me add my own version:

```
mov ax, ORIG_GAME
mov bx, SUCKS
cmp ax, bx
jnz Maybe
mov cx, SUCK
jmp end
MAYBE:
mov cx, MAYBE_OK
END:
```
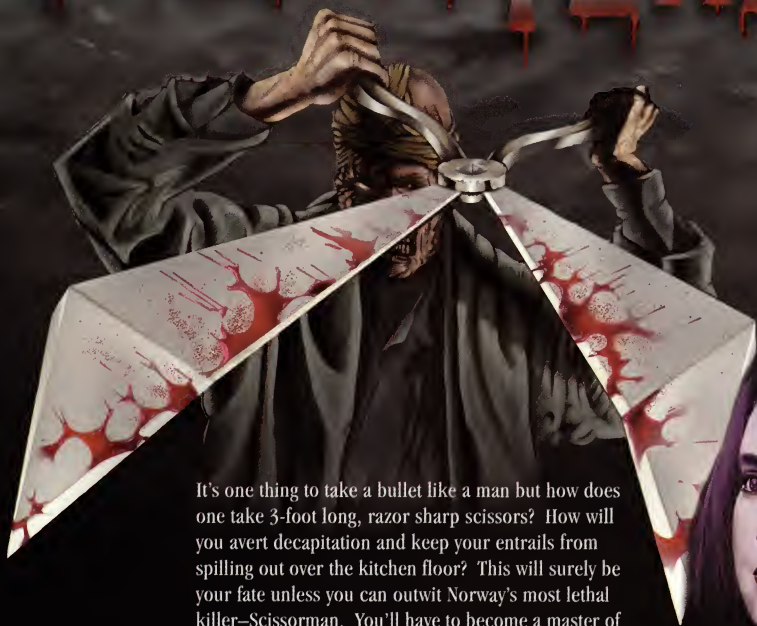**Josh**
JMF94001
@UConnVM.UConn.Edu

OK, we've got three free subscriptions here for the first code examples written in FORTRAN, COBOL, and 6502 Assembly.

SHEAR TERROR

It's one thing to take a bullet like a man but how does one take 3-foot long, razor sharp scissors? How will you avert decapitation and keep your entrails from spilling out over the kitchen floor? This will surely be your fate unless you can outwit Norway's most lethal killer–Scissorman. You'll have to become a master of stealth and deception to avoid being cut to ribbons in this blood-soaked horror adventure.

- Five playable characters and ten different endings for super-extended replay value.

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- Bone-chilling sound effects.

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ASCII ENTERTAINMENT

PlayStation

MATURE
AGES 17+
M
CONTENT RATED BY
ESRB

Next Month

```
( Insert picture of
  hard-core gamer,
  it could be you )
```

How hard-core are you?
Have you ever brought a move list to an arcade? Have you memorized the Kanji for "Save" and "Load"? Do you own a TurboGrafx-16? Can you hum the complete song from *Mario*? *Sonic*? Can you do a passable imitation of the *Pole Position* woman's voice? Next month, we present the ultimate hard-core gamer checklist. How will you measure up?

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Smart readers have already subscribed. To find out how you too can save money and guarantee your copy, turn to the insert between pages 128 and 129.

ACTUAL GAMEPLAY

Are you ready for total war immersion?

HEAR EVIL

FEEL EVIL

SEE EVIL

Cover story:
Who runs the American game industry? The answer is revealed inside in our landmark feature on America's power players

Hardware:
3Dfx's Voodoo^2 is the most powerful 3D graphics technology ever seen on PC. We've got the exclusive preview inside

Intel says its AGP architecture will revolutionize 3D game graphics. Look inside for the full story

Exclusive interview:
Sony's Phil Harrison, VP of third-party relations and R&D, on PlayStation's competitors and the future of the market

Previewed:
Infogrames' *Outcast*, JVC's *Iron John Hawk*, Square's *Parasite Eve*, Nintendo's *Zelda 64*, Psygnosis' *Newman Haas Racing* and *Wings of Destiny*, Konami's *Hybrid Heaven*, Ritual's *SiN*, Microsoft's *Asheron's Call*, and Enix's answer to *PaRappa*, *Bust-a-Move*

38 new games reviewed
including *Diddy Kong Racing, Top Gear Rally, Duke Nukem 64* (N64); *Crash 2, Tomb Raider II, Fighting Force* (PlayStation); *Dead or Alive* (Saturn); *Sid Meier's Gettysburg, Uprising, Postal* (PC); *Ultima Online, Meridian 59* (Online); *Galapagos* (Mac)

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